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FACTORS ASSOCIATED WITH THE PRACTISE OF BREAST SELF EXAMINATION

BY

KARIN OLSON

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IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

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DEDICATION

This dissertaion is dedicated to my mother, Lois Olson, whose wisdom and prayerful attention has always been a great source of support.

Abstract

Despite many therapeutic advances, breast cancer remains a major killer of Canadian women. Since its etiology is uncertain, the current approach to reducing associated morbidity and mortality is early detection through screening: mammography, physical examination, and breast self-examination (BSE).

Most Canadian women know about BSE but few practise it . Since previous findings have been contradictory, the purpose of this study was to develop a new model of factors associated with those who practise (or do not practise) BSE.

The model was constructed following ethnoscientific analysis of interviews with 13 women. Eleven categories of characteristics associated with BSE were identified. These categories were further refined into four components — social context, information, meaning of having breast cancer, and routine — which comprise the BSE Practise Model.

Based on the above analysis, a BSE attitude questionnaire containing 11 subscales were developed. Following content validation, the subscales were placed in a questionnaire with the Crowne-Marlowe Social Desirability Response Index (CMSDI), selected demographic items, and a BSE practise question and pretested with a group of 24 women to determine internal consistency, stability, potential social desirability response bias, and time required for completion. Cronbach's alpha for all subscales was 0.8 or higher. Eight subscales had test-retest correlation coefficients of 0.7 or higher. None of the subscales showed evidence of social desirability response bias. The instrument took 15 minutes to complete.

Following revision, the questionnaire was admistered to 341 women. Complete questionnaires were obtained from 158 women. Cronbach's alpha for 10 of the subscales was 0.7 or higher although four of the subscales showed minor potential for social desirability response bias. The validity of the subscales was analyzed by conducting a factor analysis (Varimax rotation) for 11 factors. Eight latent variables were identified. The

validity of the model was analyzed by conducting discriminant analysis and stepwise multiple regression. Eighty-five percent of participants were correctly classified in terms of their BSE practise based on the latent variables. Four composite scores, representing the four components of the BSE Frequency Model were constructed. These scores accounted for 41% (Definition 1) to 53% (Definition 2, including education) of the variance in BSE frequency of practise.

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I would like to acknowledge the many individuals whose generous contributions made it possible for me to complete this study. First, I would like to acknowledge the 13 women who each met with me on several occasions during the qualitative phase of the study. They were like co-investigators.

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CHAPTER I: BREAST SELF-EXAMINATION: AN IMPORTANT HEALTH PRACTICE

Introduction

Breast cancer is a leading cause of death among women in Canada. In 1987, there were approximately 11,400 new cases of breast cancer and 4,400 deaths associated with breast cancer (Canadian Cancer Society, 1987). It is estimated that in 1989 there were 12,300 new cases of breast cancer and 4,800 deaths associated with this disease (Canadian Cancer Society, 1989). There are approximately 540,000 new cases of breast cancer per year world-wide, 40% of which occur in the developing countries (Semiglazov & Moiseenko, 1987).

Since the etiology remains uncertain, the main approach to this serious health problem has been medical in nature (e.g., mammography, radiotherapy, chemotherapy). Another approach to early detection under the control of the woman herself is breast self-examination (BSE). Despite considerable debate regarding the efficacy of this approach, it is generally thought that BSE may also aid in reducing the morbidity and mortality attributed to breast cancer. The purpose of this study is to identify and understand the factors associated with doing and not doing BSE.

The epidemiology and etiology of breast cancer

Despite many new technologic, surgical, and pharmacologic developments, the epidemiologic patterns of breast cancer in Canada and the United States have remained relatively constant since the early 1900's. Age-adjusted death rates generally follow incidence curves and show a gradual increase with age, climbing more sharply beginning in the fourth decade and levelling out somewhat after the age of 75. The rates of breast cancer among immigrants to the United States from countries with low breast cancer rates (e.g., Japan) remain lower than the rate for American women, but these rates rise above the rate

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While the etiology of breast cancer remains uncertain, a number of risk factors have been identified, and the trends (noted above) suggest a lifestyle factor (Spratt, Donegan, & Greenberg, 1988). Lubin, Burns, Blot, Ziegler, Lees, and Fraumeni (1981) note that the age-adjusted relative risk of breast cancer increased significantly across all ages with a greater consumption of beef, pork, and sweet desserts. In their analysis of the relationship between breast cancer rates and per capita fat intake (kcal) in 21 countries, Prentice, Kakar, Hursting, Sheppard, Klein, and Kushi (1988) report that a straight-line regression accounted for 58% of the variance in incidence rates (p<.0001). The National Cancer Institute is currently undertaking a randomized clinical trial to determine whether reduction of dietary fat among middle-aged women will reduce breast cancer. Repeated demonstrations of a strong familial tendency suggest that an inherited factor is also likely (Anderson, Goodman, and Reed, 1958; Jacobsen, 1946; Lees, Burns, May, and Jenkins, 1984; Wynder, 1976). Other factors include ionizing radiation (Spratt et al., 1988), reproductive factors such as low (2 or less) parity, early (before 12 years) menarche, 30 years or more of menstrual history (Lubin et al., 1982; Shapiro, Strax, & Venet, 1968), late (over 35 years) age at first birth (McMahan, Cole, & Brown 1973), and previous breast cancer (Papaioannou, 1974).

Other risk factors, which are inconclusive or contradictory, include viruses (Papaioannou, 1974), reduced estriol production (Dickson, MacMahon, & Cole, 1974; Lemon, 1965 [cited in Donegan and Spratt, 1988]), reduced androgen production (Bulbrook et al., 1964; Bulbrook, 1973), increased prolactin levels (Hobbs, Salih, & Flax, 1973), hypothyroidism (Buckman & Peak, 1976; Repert, 1952), estrogen ingestion (Arthes, Sartaell, & Lewison, 1976; Burch & Byrd, 1971; Centers for Disease Control, 1983; Glass, Hoover & Finkel, 1979; Hoover, Gray, & Cole, 1976; Lubin et al., 1982;

Royal College of Family Practise, 1981), a history of breastfeeding (Lubin et al., 1981), and tonsillectomy (Lubin et al., 1981).

Based on an analysis of risk studies to date, Carter, Thompson, Bourdeau, Andenes, Mustin, & Straley (1987) analyzed risk data for a cohort of approximately 50,000 women 40 years of age or older in the northwestern United States. They estimated that 80% of the breast cancers occurring in this group of women occur among those women identified in their model as being at increased risk (those in the HR, MR, or BR categories in Table 1), and approximately 20% of the breast cancers occur to those women identified by their model as those not at increased risk (NMR category). The relative risks for the HR, MR, BR, and NMR categories were x6, x2, x1.5, and x1.2 respectively.

Table 1

Breast cancer risk categories identified by Carter, Thompson, Bourdeau, Andenes, Mustin, and Straley (1987)

Risk Category	Recommendation
High Risk (HR)	previous breast cancer or mother with breast cancer or age 50+ and two variable risk factors (VRF)*
Moderate Risk (MR)	under age 50 plus any two VRF or age 50 plus any one VRF
Borderline Risk (BR)	under age 50 plus any one VRF

* Variable Risk Factors are previous other cancers, close relative with breast cancer, menarche age 10 or earlier, nulliparity, first birth after 30 years of age, menopause after 55 years of age, and previous benign breast disease.

Screening to reduce morbidity and mortality of breast cancer

Since the etiology of breast cancer remains uncertain, to date, the best approach to reducing the morbidity and mortality associated with breast cancer has been early detection through screening (Carter et al., 1987; Ferguson, Meier, Karrison, Dawson, Straus, & Lowenstein, 1982; Fisher, 1978). The nature of breast cancer tumors, however, has posed some difficult challenges in the screening arena.

Screening Challenges

The first of these challenges is related to the biological nature of breast cancer tumors. Some kinds of tumors are more aggressive (i.e., metastasize more quickly) than others. Until recently, it had been assumed that there was a universally strong positive correlation between the early detection of breast cancer through screening and reduced morbidity and mortality; however, according to Spratt et al. (1988), this is not necessarily the case. Following the Breast Cancer Detection Demonstration Project (BCDDP), investigators concluded that breast cancers could be divided into three groups (Heuser, Spratt, & Polk, 1979a; Heuser, Spratt, & Polk, 1979b):

1. those that grew so rapidly that even if they were found when they were small using BSE, physical exam, and/or mammography they had already metastasized extensively, thus decreasing the chance of a favorable treatment response;
2. those that grew more slowly and often had either not metastasized at all or had only spread locally by the time they were detected using mammography and/or BSE, thus increasing the prospect of a more favorable treatment response; and
3. those that grew very slowly and, despite their size, did not seem to metastasize, thus also responding favorably to treatment.

Tumors in the first group seemed to result in death despite rigorous screening protocols. Compared to slower growing tumors, faster growing cancers were more likely to have metastasized by the time of detection ($p<0.05$) (Heuser et al., 1979a, 1979b). The faster growing tumors tended to be detected as lumps that appeared between annual mammograms and were found accidentally or by women doing BSE. The slower growing and often less aggressive tumors tended to be discovered through mammography before they were palpable. Spratt, Chang, Heuser, Kuhns, Buchanan, and Polk (1983) studied 28 tumors detected between annual screenings using BSE in the BCDDP project. Upon retrospective review of mammograms, they found 13 cases in which there were mammographic abnormalities but no tumor nucleus shadow and 15 cases in which no abnormalities were noted. These 15 cases, often labelled "acute carcinomas," were more common in younger (under 50 years) women with heavy, dysplastic breasts (making palpation and mammography more difficult) and no family history of breast cancer. The growth patterns were infiltrative, thus delaying formation of a palpable mass, and the tumors were often associated with metastases to regional lymph nodes at the time of diagnosis. The 13 "missed" cases, often labelled "slow carcinomas," were more responsive to treatment. Thus, the benefits of detecting breast cancer early are more complex than many investigators initially realized. For those women who find acute carcinomas early, a good prognosis seems unlikely at this time; however, for those who detect slow-growing tumors early, the future is considerably brighter.

In the early evaluation of breast cancer screening programs, investigators frequently noted that treatment results for those whose cancers were detected using mammography seemed better than for those whose cancers were found accidentally or by using BSE. This phenomenon, known as length bias, was due to the fact that tumors discovered during mammographic screening were often less aggressive and therefore had a more favorable outcome.

The second challenge which is closely related to the first challenge, involves the difficulties in determining when breast cancer tumors need to be detected in order to maximize the chance of a favorable treatment response. From a screening standpoint, Spratt et al. (1988) introduced the concept of a cancer control window (CCW). A CCW is the time between the moment a cancer is large enough to be detected and the moment it disseminates. It is generally thought that the greatest opportunities for reducing morbidity and mortality associated with breast cancer lie in the detection and treatment of tumors during this time. As discussed above, some very rapidly growing cancers are probably not detectable before dissemination.

Estimates of doubling time aid in understanding the length of the CCW. Doubling time is one of several measures of tumor growth and is the time required for a cancer to double its volume. Individuals seldom survive more than 40 doublings. Spratt, Katenbach, and Spratt (1977) report median doubling times ranging from 23 to 209 days (median 120 days) based on a sample of 19 primary breast cancer patients. Spratt (1981) estimates that the CCW for breast cancer was 14 doublings at the very most and was probably closer to 9 doublings. Thus, according to these figures, rapidly growing tumors can potentially go from being barely detectable to metastatic in 207 (9 x 23) days or 6.9 months. A more slowly growing tumor, on the other hand, could remain non-metastatic for up to 2926 (14 x 209) days or 8 years.

Given the variable growth rates of breast cancer, screening-related diagnoses are sometimes made after the case is already terminal but earlier than it would have been if the individual was not diagnosed until the disease presented clinically. In the evaluation of screening programs, this phenomenon, known as lead time bias, often caused investigators to attribute an increase in survival of screened individuals to screening when in fact the increased survival was related to an earlier diagnosis of an already terminal condition.

There are many ways to estimate lead time. According to Spratt et al. (1988), lead time for mammographic screening is obtained by multiplying the number of doublings required for a cancer to grow from the size detectable using mammography to the size detectable using BSE by the net doubling time for the interval of growth. In the BCDDP, doubling times based on xeromammograms were determined in 23 cases and ranged from 109 to 944 days (log mean was 327 days). No cancer smaller than 2.1 mm was correctly diagnosed using mammography (Spratt et al., 1988). Foster, Lang, Constanza, Worden, Hains, and Yates (1978) found that the mean tumor diameter discovered using BSE was 20.4 mm. According to Spratt et al. (1988), approximately 9 doublings would be required for a cancer to grow from 2.1 to 20.4 mm. Estimating conservatively and using the BCDDP data but without adjusting for age-related variations, the lead time associated with mammography could vary from 981 days (9 x 109) to 8496 days (9 x 944), with a mean of 2943 days (9 x 327), or 2.4 years to 20.7 years, with a mean of 7.1 years. Moskowitz and Fox (1979) estimate the lead time gained by mammographic screening to be 2.2 years (+/- 0.4) for those under 50 years and 3.2 years (+/- 0.4) for those over 50 years. In the BCDPP, Heuser et al. (1979b) and Spratt, Greenberg, and Heuser (1986) report a lead time between 1.8 and 6.9 years, depending on age.

In summary, then, it can be seen that screening can detect breast cancers earlier than they might otherwise be found, but only some of these will still be within the CCW. Obviously, the earlier the cancer is detected, the greater the chance that it would still be within the CCW and favorably respond to treatment.

Types of Screening

Three techniques, mammography, physical examination, and breast self-exam (BSE), are currently being used for the early detection of breast cancer. While any one of these techniques may be of some benefit on its own, the best approach appears to be one which utilizes all three. The BCDDP, which screened 290,000 women in the United States, found that of the 3,557 cancers they detected, 42% were apparent only on mammography, 9% did not show on mammography but were found by physical exam, and 17% were detected by BSE between annual exams (Baker, 1982). The bulk of the remaining 32% were detected by more than one screening method, leaving a small number for which the method of diagnosis was unknown. Based on their analysis and findings from other studies, Carter et al. (1987) recommend a breast screening schedule (see Table 2).

Table 2

Breast screening schedule proposed by Carter, Thompson, Bourdeau, Andenes, Mustin, and Straley (1987)

Risk category	Recommended screening protocol
High Risk	annual mammogram, physical exam, and BSE instruction in screening unit
Moderate Risk	mammogram, physical exam, and BSE instruction every three years in screening unit. Physical exam and BSE instruction in primary care center during other two years
Borderline Risk	mammogram, physical exam, and BSE instruction every five years in screening unit. Physical exam and BSE instruction in primary care center years
No Measureable Risk	referral as necessary to screening unit, annual physical exam and BSE instruction in primary care center

Mammography and Physical Examination

Mammography, a specialized type of x-ray, has been of interest to health care professionals since Salomon (cited in Donegan and Spratt, 1988) first showed a correlation between the clinical, pathologic, and roentgenologic characteristics of breast tumors. The main advantage of mammography is that it is noninvasive and assists in the identification of nonpalpable, small lesions. It has been estimated, however, that mammography misses 12% to 16% of clinically demonstrable tumors (Donegan, 1988) and that for women less than 50 years of age, it misses as much as 41% of the tumors. The reduced effectiveness of mammography among younger women is thought to be primarily due to the density of younger breast tissue. For this reason, many argue that women should receive a physical examination by a health care professional at the same time as their mammogram.

There is an ongoing debate about the carcinogenic effect of ionizing radiation.

It is well-known that this result is clearly related to age at the time of initial exposure, with the greatest effect being seen among children, adolescents, and young adults, and that it is cumulative. While all of the evidence is not yet in, there does not seem to be a significant detectable effect on breast cancer incidence for those exposed during mammography beginning around the age of 40 years (Feig, 1983, 1984a,1984b), particularly given the low levels of radiation per examination now possible.

Several randomized trials of screening for breast cancer have consistently shown the value of mammography for detecting small non-metastic tumors. In the United States, the HIP study showed a 24% reduction in the 10 year mortality rate from breast cancer (Shapiro, Venet, & Strax, 1982). No reduction for women under 50 years of age was noted, but a recent study by Habbema, Van Oortmarssem, and Van Patten (1986) suggests a delayed benefit for this group. Verbeek, Hendriks, & Holland (1984) and Tabar et al. (1985) also found a reduction in mortality for those over 50 years of age.

Breast self-examination (BSE)

Breast self-examination (BSE) is a method of physically checking one's own breasts for monthly changes. A critical issue in the evaluation of BSE is technique. There have not been any studies comparing the relative efficacy of the various methods of BSE. Perhaps for this reason, there is little uniformity in the methods used in the various studies cited in this document. The following description is the result of the investigator's clinical work with a physician, Dr. Patricia Burns, a recognized clinical expert in this field.

In order to have the best chance of detecting potentially malignant changes in breast tissue, BSE must be done every month. Because changes in breast tissue follows a monthly cycle that roughly parallels that of the ovaries, the best time to detect real changes in breast tissue is between days 10 and 14 of the menstrual cycle, when monthly cylical influences and fluid retention are minimal. Women no longer menstruating should choose a day (e.g., first Saturday of the month) convenient to them and check their breasts on that day each month. BSE should be undertaken in either the standing or sitting position, which includes an examination of part of the breast that extends into the axilla, and in the lying position as some cancers are more readily detectable in one position than the other. While many different methods of palpation are used, it is crucial that the method of choice be one which ensures complete coverage of all breast tissue. The easiest method of palpation for most women is one in which they begin the examination at the clavicle. Using the opposite hand and proceeding side to side, the skin under the hand is moved in small circles over the underlying structures. Then, without removing the hand from the surface of the skin or changing the pressure under the hand, the hand is gently moved about an inch and the same process repeated. Once the midline or the acromial process is reached, the hand is moved down about an inch and the above process is repeated, coming back in the other direction. As the axillary region is reached, the lateral edge of the examination region should be extended distally to include the area below the axilla. On the last "row" of BSE, the hand should be partly on breast tissue and partly on the chest wall. In this way, tumors on the periphery of the breast are less likely to go unnoticed.

The position of the hand in BSE is very important. In order to maximize the chance of detecting an abnormality, all four fingers must be used, and all knuckles kept flat. As the hand moves around the curve of the breast to the area below the axilla, flexion of the wrist makes it possible to keep the whole surface of all four fingers on the breast. Clearly, the correct practice of BSE requires specific information and must be practiced in order to be perfected. Clinical records show that women who use this method can detect breast cancer tumors of about 10 mm in size (Patricia Burns, personal communication, 1989). This is highly significant because if BSE were done as outlined above it could aid in the detection of a greater proportion of breast cancers still within the CCW, a time when tumors are more likely to respond favorably to treatment.

The efficacy of BSE is controversial. As was noted above, tumors detected using BSE are usually much larger than those initially found using mammography and therefore have a poorer prognosis. Foster et al. (1978) report that the mean size of tumors detected using BSE was 20.4 mm; whereas, those found using mammography have been as small as 2.1 mm (Spratt et al., 1988).

The sensitivity of the screen (the ability of the screening method to detect breast cancers) is reported to vary between 26% and 70% (Baker, 1982; Gastrin, 1976; Greenwald, Nasca, & Lawrence, 1978; Gohagan et al., 1980; Gugley & Brown, 1981; Tabar & Gad, 1981). Thus, some suggest that women who do BSE may miss cancers and be falsely reassured that they are healthy. Hall, Adams, and Stein (1980), attempting to improve the sensitivity and specificity of BSE, found that the percentage of false positives actually increased following training using silicone breast models. This finding has led many investigators to conclude that the best way improve the predictive ability of BSE is for each woman to practice on her own breasts.

Although some have found no relationship between BSE practice and the stage of disease at diagnosis (Gould-Martin, Paganini-Hill, Casagrande, Mack, & Ross 1982; Senie, Rosen, Lesser, & Kennie, 1981; Smith, Francis, & Pollisar, 1980), Constanza and Foster (1984) found that in their sample of 1004 women with breast cancer there were fewer breast cancer deaths among BSE performers than non-BSE performers. After 5 years, 75% of those who had done monthly BSE were still alive compared to 57% who had not done BSE. Several researchers have found that women who did BSE on a monthly basis tended to be diagnosed with earlier stage disease than women who did not do BSE (Feldman, Carter, Nicastri, & Hosat 1981; Foster et al., 1978; Greenwald et al., 1978; Huguley & Brown, 1981).

Foster and Constanza (1984) also estimate that a lead time of 3 years would have to be taken into account when attempting to estimate the beneficial effects of this type of screening on morbidity. This figure has been criticized due to the use of a uniform cancer volume doubling time of 100 days. Given the extreme variation in growth rates among volume doubling time of 100 days. Given the extreme variation in growth rates among breast cancers, the difficulties in establishing a suitable value for doubling time is understandable.

Hill, White, Jolley, and Mapperson (1988) undertook a meta-analysis of 12 studies, which included 8118 patients with breast cancer. The purpose of this analysis was to determine what relationship, if any, existed between regional lymph node state or tumor diameter and BSE. Based on a logistic regression of available data (six studies), the investigators found that those who had done BSE at least once before their breast cancer was diagnosed were less likely to have cancer in their surrounding lymph nodes than those who had not done BSE (odds ratio 0.66, 95% confidence interval 0.59 to 0.74). The investigators then compared the proportion of women who found their tumor while doing BSE with those who found their tumor accidentally. They found that 42% of the tumors in the group who found their tumor by doing BSE had metastasized to the surrounding lymph nodes, while 46% of the tumors in the group who found their tumors accidentally had metastasized. This difference was not significant. Last, in an analysis of data from eight studies, the investigators found that significantly fewer women who had practised BSE before their illness had tumours with a diameter of 2 centimeters or more (odds ratio 0.56, 95% confidence interval 0.38 to 0.81).

Despite the difficulties associated with BSE, most researchers argue that it is somewhat beneficial when used alone and that in combination with other early detection techniques, it has been particularly useful in detecting breast cancers that become palpable between yearly check-ups and/or mammograms. These would likely be either very aggressive tumors (acute carcinomas) or slow-growing tumors that did not appear on an earlier mammogram. Although the prognosis for acute carcinomas is not favorable at this time, new advances in surgical and pharmacologic treatment may prove helpful in the near future. The prognosis for slow growing tumors is more favorable, particularly if they are

Part of the purpose of the recently completed Canadian National Breast Screening Study (NBSS) was to assess the relative utility of BSE in the early detection of breast cancer. The method of BSE taught was similar to the method outlined above. Preliminary results from this study are expected in 1990 (Anthony Miller, personal communication, 1989). A randomized clinical trial of BSE is currently being conducted in the Soviet Union. This study of 150,000 women is expected to demonstrate whether BSE is able to reduce the mortality associated with breast cancer (Semiglazov & Moiseenko, 1987). These results will be especially interesting in light of the NBSS data since the same BSE technique was taught in both cases.

Statement of the Problem

As can be seen from the material presented above, BSE does not require technological support or regular access to the health care system. It is inexpensive, relatively easy to do, and appears to aid in the early detection of breast cancer if done on a monthly basis. Yet, despite extensive health education efforts by nurses and others, relatively few women do BSE on a monthly basis (Baines, Risch, Juin & Fan, 1986; Health and Welfare Canada, 1981; Thornberry, 1986). These findings suggest that the regular performance of BSE requires more than an understanding of how it is done, and give rise to the following research question:

What factors are associated with doing and not doing BSE?

Delineation of the Research Problem

This research question has been explored in great depth by others, but their findings have been contradictory. The literature in this area will be reviewed in Chapter 2. While the usual methodologic and design problems may be partly responsible for these findings, three more basic areas of concern must also be considered. First, although variables of interest in previous studies were appropriate, given the current way of thinking about these three more basic areas of concern must also be considered. First, although variables of interest in previous studies were appropriate, given the current way of thinking about these matters (drawn from psychological theory and/or studies of other health behaviors intended to **reduce the risk** of developing disease), they may have been incorrect. BSE is intended to identify changes in breast tissue that may be cancerous and, in this way, identify women who are **sick**. It is based on the assumption that if disease is detected early one can reduce more extensive sickness and, in this case, certain death. Risk reduction practices, on the other hand, are based on the assumption that it is possible to **prevent** one from becoming sick. If women think of early detection health practices as being different from risk reduction health practices, it is not surprising that models used primarily to understand risk reduction behavior were unable to predict BSE practise with any great degree of precision.

Second, although some investigators identified the variables they chose to study from questionnaires in which women were asked to give a "short answer" to some particular question, most of the techniques constrained women's answers to a "true/false" response or a number on a Likert scale. With the exception of those studies based on the Theory of Reasoned Action, the potentially complex views of women were not studied in a way that they could be tapped.

Third, the majority of investigators who tried to show that certain attitudes or beliefs were precursors to BSE designed their studies in such a way that attitudinal/belief data were collected simultaneously with behavioural data. In order to validate their models, it would have been necessary to conduct prospective studies, collecting the attitudinal/belief data first and the behaviour data later.

The combined results of the problems identified above is that previous investigators of BSE may well have asked the wrong questions and in ways that could not have answered their research questions. These studies were based on an inappropriate theoretical foundation (risk reduction instead of early detection), were generally not

not designed to facilitate the testing of the proposed model. Given the implications of these errors, several additional questions were added to this study. They were

> What would the variables of interest be in a study on BSE if they were derived from semi-structured interactive interviews with women instead of the currently used methodologies?
>
> Would the variables identified though interviews be the same as or different from those already identified using other methodologies?
>
> Would the variables identified in the interviews better predict BSE frequency than the variables of the currently used models?
>
> How effectively could the variables identified in the interviews classify individuals in terms of their BSE frequency?

In order to answer these questions, a series of interviews were undertaken with English-speaking Canadian women 30 to 65 years of age who lived in a large city in western Canada. Variables identified by the women as being related to the practice or non-practice of BSE were identified and organized into an initial theoretical model. This model was then used as the basis for the development of a questionnaire. Following the testing of the questionnaire, it was administered to a larger group of women in order to determine whether the variables identified in the interviews and built into the model predicted BSE practice and non-practice.

Organization of the thesis

The following chapters document the process undertaken in this study:

Chapter II: A review of selected perspectives regarding the determinants of health behavior

In this chapter, several models that have been used to study BSE in the past will be presented. In each section, the major studies that used each model will be presented. The models to be presented include the Health Belief Model (HBM), Health Locus of Control Theory (HLCT), and the Theory of Reasoned Action (TRA). Findings regarding other variables (e.g., demographic, health care system, attitudes, health education) not particularly associated with one theoretical view will also be outlined. This material will be used to provide a justification for the methodology used in the present study and as a backdrop for the discussion of results.

Chapter III: Discovering and understanding the factors associated with doing and not doing breast self-examination

In this chapter, the methods and the plan of work that were used in the model development phase of this present study will be described. The data analysis will be presented and this will be followed by a presentation of the initial model.

Chapter IV: The development of subscales to measure factors associated with doing and not doing breast self-examination

In this chapter, the method used to develop subscales to measure factors associated with doing and not doing BSE will be described. The results of reliability and validity testing will be presented.

Chapter V: Validation of the model

This chapter will focus on the method and results associated with the validation of the model. Issues related to sampling, sample size, and method of data collection will be discussed. Revisions to the model based on triangulation will also be presented.

Chapter VI: Discussion.

In this chapter, the results of the work described in Chapter III, IV, and V will be discussed in light of the material presented in Chapter II. Similarities and differences between the new model and those previously used will be discussed.

Chapter VII: Implications for future research and breast cancer early detection programs

In this chapter, the implications of the model developed in this study for future research and for breast cancer early detection programs will be discussed.

Definition of Terms

Breast self examination (BSE) — a set of steps taught to women for the express purpose of detecting potentially cancerous changes in their own breast tissue (e.g., lumps, thickening). BSE is not diagnostic, but rather it is a method for identifying women who require further medical attention. To be done correctly, it should be done monthly and at the same time each month (between day 10 and 14 of the menstrual cycle if menstruating). For the purposes of this study, women who regularly examine their breasts at least once every three months will be defined as those who practice BSE. Those who examine their breasts less than once every three months or not at all will be defined as those who do not practice BSE.

Early detection practices — practices that enable the detection of a disease before it would normally be detected clinically. Early detection practices can be performed by an individual on themself (e.g., breast self-exam) or by a health professional (e.g., mammography, physical examination of the breast). The assumption underlying early detection practices is that the early detection of a health problem will reduce the morbidity and mortality associated with it by making earlier treatment possible.

Mammography — a special x-ray examination of the breast using small amounts of radiation to detect abnormal changes in breast tissue.

Physical examination of the breast — an examination of the breast usually by a physician or nurse using roughly the same procedures as the breast self-examination for the purpose of detecting changes in breast tissues (e.g., lumps, thickening). It is usually, but not always, undertaken at the time of one's yearly check-up.

Risk factors -— factors thought to be associated with an increased probability of getting some specific disease. Risk factors are often categorized as either modifiable (e.g., smoking) or non-modifiable (e.g., family history). The assumption is that modifiable risk factors are ones over which individuals have a reasonable amount of control and are ones that could be reduced or eliminated if an individual chose to do so. Non-modifiable risk factors are assumed to be ones over which individuals have essentially no control.

CHAPTER II: A REVIEW OF SELECTED MODELS OF THE DETERMINANTS OF BREAST SELF-EXAMINATION

Breast self-examination (BSE) has been the topic of many studies in which the primary objective of the investigation was to understand the determinants of this early detection health behaviour. While other health behaviours have been viewed from a wide variety of explanatory models (e.g., socio-cultural, behavioural), the models for understanding BSE have been primarily cognitive in nature, focusing on the factors that affect the decision to do or not to do BSE. Some studies were based on an existing model of health behaviour, while others were not. On occasion, several models of health behaviour were combined, while in other studies the author examined the effect of certain demographic or health system variables in conjunction with some model of health behaviour. Regardless of the model, the results to date have been contradictory and incomplete. The purpose of this chapter is to analyze these studies in the light of the model used and show why a new model for understanding detection health behaviour is needed.

Demographic variables

The relationships between several demographic variables and BSE frequency have been explored in a number of studies. The results of studies conducted by Fink, Shapiro, and Lewison (1968) and Stillman (1977) are often cited as evidence of a relationship between age and BSE.

Fink et al. (1968) studied a group of women randomly drawn from among 11,500 women between the ages of 40 and 64 years of age who were eligible to participate in the Health Insurance Plan of Greater New York (HIP) breast cancer screening program. The purpose of this screening program was to evaluate the use of mammography in the early detection and treatment of breast cancer. Interviews were conducted with a random sample of those who participated in the program as well as those who did not. Fink et al. found that those who participated in the breast cancer screening program tended to be younger (< than 50 years) than non-participants. These finding were all significant at the 0.05 level or greater. It should be noted, however, that this study examined the relationship between participation in a screening program that used mammography, instead of BSE and that the relationship between the demographic variables studied and BSE frequency was not reported. Therefore, this study will not be included in the discussion which follows.

In a study of a convenient sample of 125 women who had not had treatment for cancer or breast lumps and who were recruited from various women's organizations in a community of approximately 4000 women, Stillman (1977) found that 33% of women 30-39 years of age (N=71) practised BSE monthly, while 53% of women 40-60 years (N=15) were monthly practicers. Stillman also collected data regarding occupation, income, education, and marital status. Most of the participants were married (97%), educated (99% completed high school), and had incomes above the mean of the community. An analysis of the relationship between these demographic variables and BSE frequency was not presented. While data regarding religion *per se* were not explicitly collected, two of the groups from which subjects were recruited were religiously affiliated: one Catholic and one Jewish. The women from the Catholic organization had the highest mean BSE practice score, followed by the women from the Jewish organization, and then by the women from the non-religious organizations. No statistical analysis was undertaken by Stillman but enough information was presented to allow a reader to test the difference between the proportions of women who did not do BSE in both the 40-60 year and 30-39 year age groups. The differences were not insignificant in either case (do not do BSE p=0.08, do BSE p=0.07).

A number of other investigators have included demographic variables in their studies, but very little support was found for a relationship between the demographic variables and BSE. Howe (1981) studied a group of women randomly drawn from among those known to have a higher risk for breast cancer (white, married, higher socioecomomic status). Howe found that while 70% of those who never did BSE were over 40 years of age 65% of those who did BSE were also over 40 years. Howe also found that women who were well educated were more likely to do BSE (Chi Square 40.37, df=18, p=0.002).

Trotta (1980) analyzed the responses from questionnaires received from a convenient sample of 446 women employed by a large insurance company in the eastern United States. The women ranged in age from 18 to 64 years of age and were predominantly Caucasian and well-educated (high school graduates). Trotta found that none of the demographic characteristics (race, religion, socioeconomic status (SES), and age) were significantly associated with BSE frequency.

In a study of a convenient sample of 616 female professional staff and ambulatory care patients at a large urban hospital, Bennett, Lawrence, Fleischmann, Gifford, and Slack (1983) found that age, education, income, marital status, religious preference, and race were not associated with BSE frequency. The majority of the professional staff were under 35 years of age (81%), white (77%), and earned in excess of $20,000 US per year. The majority of the patient volunteers were also under 35 years of age (85%), were almost evenly split along racial lines between white and black, and had at least a high school education (79%). Also, 47% of the participants earned less than $11,000 US per year. Thus, the sample was relatively heterogeneous.

Celantano and Holtzman (1983) conducted telephone interviews with a group of 308 women randomly drawn from a population of 75,000. They reported that women over 65 years of age did monthly BSE less often that younger women (Chi Square and df not reported, p<0.05), a finding which is opposite to the findings of Stillman (1977). They also note that blacks reported doing BSE monthly more often that whites (p<.0.05) and that women from families with annual salaries over $15,000 were more likely to practice monthly BSE that women from families with lower annual salaries (p<0.01). No relationship was found between BSE frequency and marital status.

In a study of a convenient sample of 301 women evenly distributed between the ages of 17 and 82 who were recruited from women's organizations in a large metropolitan centre, Champion (1985) found no relationship between the frequency of BSE practise and age, marital status, socioeconomic status (SES), race, or education. While all age groups were equally represented, the majority were white and protestant. The mean educational level was that of a second year university student.

Based on her previous work, Champion (1987) studied a convenient sample of 585 women who were approached in the waiting room of a large out-patient clinic. The women were between the ages of 12 and 74 years, predominantly Caucasian, married, from slightly lower SES backgrounds, and well-educated (high school graduates). She found that age, race, and marital status were not associated with BSE frequency. A significant correlation (r=0.19, p<0.001) was found between BSE frequency and years of schooling. As education increased, women perceived more benefits and fewer barriers to doing BSE.

In a later study of a random sample of 380 women aged 35 years and older who had not had breast cancer and were living in and around a large city, Champion (1989) examined the relationship between knowledge, teaching method, confidence in ability to do BSE correctly, social influence (whether people considered to be important thought that one should do BSE), and BSE frequency. While there was no significant correlation between education, religion, SES, age, confidence, or social influence, a strong association was noted between knowledge of BSE and SES (r=0.25, p=0.001) as well as knowledge of BSE and race (Chi Square 4.11, df=3.362 p=0.007). White, high SES women were more likely to have knowledge about BSE. An analysis of the relationship between knowledge and BSE frequency was not reported, but Champion notes that knowledge correlated highly with intent to engage in BSE (r=0.19, p<0.001) and BSE proficiency (r=0.24, p<0.001). Champion also found that as religious involvement increased so did intent to do BSE (r=0.16, p<0.001) and BSE frequency (r=0.15, p<.002). No definition of religious involvement was provided.

Walker and Glanz (1986) studied a stratified random sample of 264 women who were either faculty, staff, or students at a private suburban university in the eastern United States. Although they ranged in age from approximately 18 to 64 years of age, the majority of the participants were under the age of 25 (62.9%). Only 15% were over the age of 45. Walker and Glanz failed to find a significant relationship between age, marital status, race, education, income, and BSE frequency. It was noted, however, that the population was relatively homogeneous in these respects. A significant difference was found between BSE frequency and university status (undergraduate student, graduate student, faculty, staff), with undergraduate students reporting significantly higher BSE frequency than women in the other categories ($p<0.05$).

In a study of a convenient sample of 105 women 65 years of age or older at one of two senior citizens centres in a metropolitan community, Lashley (1987) found that 61% of the women did BSE on a monthly basis. Lashley attributes the high participation rate to the availability of medical and health education services, BSE classes at the senior centre, and the fact that the sample was drawn from a relatively healthy, ambulatory population. She notes that race was a significant predictor of BSE technique, with white women being more likely to do BSE, but believes this was probably due to educational level, age, or both since a significant relationship existed between race and educational level, with white subjects reporting higher education ($p=0.005$). The black women were also older than the white women ($P=0.009$).

Rutledge (1987) undertook a study of a convenient sample of 103 women drawn from nine women's organizations. The women ranged in age from 25 to 85 years of age (mean 50.5 years), were able to read and write English, non-pregnant, non-lactating, and had not had treatment for breast cancer or breast lumps in the past year. Most were married (66%), white (84%), well educated (65% college educated, 36% in graduate study), protestant (99%), and financially "comfortable" (34% with family incomes over $50,000 US). Rutledge did not report results regarding possible relationships between BSE frequency and other demographic variables. Rutledge hypothesized that age, among other variables, would modify a woman's perception of susceptibility to breast cancer as well as the perceived benefits and barriers to doing BSE monthly and would therefore be significantly correlated with frequency of BSE. This, however, did not prove to be the case (r=-0.0069, p=0.474).

Redeker (1988) studied a convenient sample of 49 women whose children attended three private preschools within a suburban community. These women ranged from 26 to 44 years of age. Twenty-six of these women worked outside the home. All of them had completed high school, and eleven were college graduates. The majority were white (90%) and Catholic (61%). Thirty percent of these women were Protestant, and the remainder were Jewish. Redeker found no relationship between education and BSE frequency, but this author notes that occupation and religious affiliation together with health beliefs and internal health locus of control explained 47.5% of the variance in BSE frequency. Analysis of variance for the main effect of religion was not statistically significant. This author did not report any further analysis of the occupation variable.

In a study of a convenient sample of 175 women between the ages of 20 and 89 (mean 42.4 years), Olson and Mitchell (1989) found no relationship between BSE frequency and education or age. In this study, subjects were drawn from among those seeking health care at a primary-care clinic over a four month period. The majority of the women had some college education (58.9%) and were married (57%).

As can be seen from a summary of the above studies (Table 3), a significant relationship between BSE frequency and the usual demographic variables is unlikely.

Table 3

Demographic variables reported to be associated with BSE frequency

	Demographic variables						
Study	Age	SES	Religion	Education	Income	Marital Status	Race
Stillman (1977)	Y*	n/a*	Y	n/a	n/a	n/a	n/a
Trotta (1980)	N*	N	N	n/a	n/a	n/a	n/a
Howe	Y	n/a	n/a	Y	n/a	n/a	n/a
Celantano/Holtzman (1983)	Y	n/a	n/a	n/a	Y	N	Y
Bennett et al.(1983)	N	n/a	N	N	N	N	N
Champion (1985)	N	N	n/a	N	n/a	N	N
Champion (1987)	N	N	N	Y	n/a	N	N
Champion (1989)							
confidence	N	N	N	N	n/a	n/a	n/a
social influence							
knowledge of BSE	N	Y	N	N	n/a	n/a	n/a
BSE frequency	n/a	n/a	Y	n/a	n/a	n/a	n/a
Walker/Glanz (1986)	N	n/a	n/a	N	N	N	N
Lashly (1987)	N	n/a	n/a	n/a	n/a	n/a	n/a
Rutledge (1987)	N	n/a	n/a	n/a	n/a	n/a	n/a
Redeker (1988)	n/a	n/a	N	N	occupa.	n/a	n/a Y?
Olson/Mitchell (1989)	N	n/a	n/a	N	n/a	n/a	n/a

*Y — positively associated, N — not positively associated, n/a — not studied or not reported

Summary

Stillman's (1977) findings are probably the results of a small unrepresentative sample and are not significant. Howe's (1981) findings, with respect to age and education suggest that age is not related to BSE frequency. The findings of Celantano and Holtzman (1983) regarding age were opposite to those of Stillman. They found that older age was associated with a decreased BSE practice. Given that Celantano and Holtzman's work was based on a random sample from a large city, their findings are particularly interesting. Champion (1989) used a random sample similar to Celantano and Holtzman but found no correlation between age and BSE frequency. It should be noted, however, that Celantano and Holtzman analyzed their data using the chi square test whereas Champion used Pearson's product-moment correlation coefficient, a stronger statistical test.

The relationship between BSE and religion initially reported by Stillman (1977), whose study was based on a convenient sample and subsequently also found by Champion, (1989) whose study was based on a random sample, is puzzling. This finding is opposite to what one might expect.

A second interesting finding of the Celantano and Holtzman (1983) study was the finding that race was related to BSE frequency, with black women being more likely to practice BSE. This was opposite to the findings of Lashley (1987). Again, however, Lashley's findings were based on a convenient sample and so may not have been representative of the population from which it was drawn. Celantano and Holtzman's (1983) findings are difficult to explain. Are there reasons why black women would be more likely to engage in BSE? The authors do not offer an explanation of their results in this area.

One problem associated with attempting to discern the influence of demographic variables, or any other variables for that matter, on BSE frequency is that most of the studies used either convenient samples or ones that were very homogeneous. In the studies undertaken by Howe (1981), Celantano and Holtzman (1983), Walker and Glanz (1986), and Champion (1989), random samples were used but the population from which the samples were taken lacked demographic variability. Only the studies conducted by Celantano and Holtzman (1983) and Champion (1989) could be said to be representative of a typical community.

A second problem associated with attempting to draw conclusions regarding the influence of demographic variables on BSE frequency was the variation in the way important constructs were operationalized. For example, some investigators categorized individuals who did BSE at least once in three months as *doers*, while others did not place an individual in that category unless they did BSE monthly. There was also considerable variation in the ways in which education, income, and socioeconomic status were operationalized.

Attitudinal variables

In this section, studies of attitudinal variables not part of a recognized theory of health behaviour will be described. Attitudinal variables found to be positively associated with BSE frequency were favourable attitudes toward screening (Howe, 1981), positive self-concept (Hallal, 1982; Rutledge, 1987), and worry about getting cancer (Hailey, 1987). A strong negative association was found between BSE frequency and both inhibition (Howe, 1981) and the fear the breast cancer surgery would diminish attractiveness (Bennett et al., 1983).

Favourable attitudes toward screening and BSE

In the study by Howe (1981), 5 orthogonal factors were extracted from a set of interview data. These were: attitude, social influence, inhibition, medical preventive health behaviour, and autonomous preventive health behaviour. Five scales were then developed based on these factors. Howe found that those who did BSE were more likely to place a high value on preventive health practices requiring a visit to a physician than those who did not do BSE (Chi Square 28.4, df=8, p=0.0005). Those who placed a high value on health practices that could be conducted independent of medical visits were also more likely to do BSE than those who did not (Chi Square 16.6, df=8, p=0.04). Howe also found that those with a positive attitude toward BSE (Chi Square 501.06, df=36, p<0.001) were more likely to do BSE than those without a positive attitude.

Self-esteem

Hallal (1982) studied a convenient sample of 207 women from a variety of groups in a large city, 42% of whom practised BSE on a monthly basis. Self-esteem was measured using the Total P of the Tennessee Self-Concept Scale (Fitts, 1965). Hallal found that when considered together with variables from the Health Belief Model (HBM) and Health Locus of Control (MHLC) self-esteem was the single best predictor of BSE practice (p<0.01), accounting for 12% of variance in BSE frequency.

In a study by Rutledge (1987), self-esteem was again measured using the Total P of the Tennessee Self-Concept Scale (Fitts, 1965). The correlation between self-esteem and BSE frequency was significant (*r*=0.2362, p=0.015).

Worry about cancer

Hailey (1987) studied factors associated with BSE among college females. Based on questionnaires returned by 230 women between 20 and 51 years of age (mean 23.9) enrolled in an undergraduate psychology class, she was able to accurately distinguish (73.9%) between those that did BSE and those that did not do BSE based on familiarity with BSE (the more the familiarity, the greater the likelihood of doing BSE) and interest in learning more about BSE (the greater the willingness to learn about BSE, the greater the likelihood of doing BSE). Those who did BSE obtained a positive centroid loading of

0.56, indicating that they were characterized by the above description of the discriminant function, while the non-examiners obtained a negative loading of -0.58.

Diminished attractiveness

An attitude found to be negatively associated with BSE frequency was the fear that breast surgery would diminish attractiveness. Bennett et al. (1983) found that women who were young (Chi Square 44.2, df=1, p<.001), college educated (Chi Square 14.7, df=1, p<.001), and/or nulliparous (Chi Square 32.2, df=1, p<.001) were more afraid that breast cancer would diminish attractiveness and that this fear was negatively associated with BSE practice (Chi Square 23.3, df=3, p<0.001). Women who were more fearful practised BSE less frequently.

Inhibition

Howe (1981) found that women that were uncomfortable talking about breast concerns were less likely to do BSE (Chi Square 45.7, df=24, p=0.005). Inhibition was measured by asking women how comfortable they were talking about their breast concerns with their husband, doctor, and/or friends and how comfortable they were in touching their breasts to do BSE. Howe says BSE seemed to be neither openly discussed nor advocated. She suggests that this lack of support may leave women unsure about whether BSE is an appropriate thing to do.

Summary

Studies involving the above attitudinal variables were plagued by many of the same problems as those considered when discussing the relationship between BSE frequency and demographic variables. In this case, only one of the samples (Howe, 1981) was random in nature. The others did not appear to represent the populations from which they were drawn. Nevertheless, several themes emerged from these studies. First, Howe's finding regarding the positive relationship between BSE frequency and a high value on preventive health practices was comprised of two parts: health practices requiring a visit to the doctors office (e.g., vision, blood pressure), which was based on three questions, and health practices that could be undertaken without going to a doctor (e.g., seatbelt usage), based on one question. One must ask whether these four questions are sufficiently representative of all of the questions one could ask about preventative health practice. No measures of internal consistency were reported for any of Howe's scales. The scales were developed from a factor analysis (varimax rotation) in which all items contributing to any one factor had a loading of at least 0.60. Thus, the items in the scale were obviously related. One must still question whether the value an individual ascribes to preventive health practices can be reliably measured by four items. The same question holds for Howe's findings regarding inhibition, which was also measured using four items.

Second, the findings of Hallal (1982) and Rutledge (1987) regarding the positive relationship between BSE and self-esteem were very interesting, particularly since they both used the same instrument for operationalizing self-esteem and since they studied different populations. A qualitative study in this area may shed more light on the role of self-esteem in the regular practice of BSE.

Hailey's (1987) findings regarding a positive relationship between BSE frequency and worrying about cancer also raises several questions. Is there some point beyond which worry becomes so overwhelming that it prevents the practice of health behaviours such as BSE? The finding of Bennett et al. (1983) regarding a negative relationship between fear of decreased attractiveness if breast surgery is required and BSE frequency among women who were young, unmarried women, and/or nulliparous suggests that fear may prevent individuals from conducting health practices under certain circumstances.

Educational variables

Educational variables found to be positively associated with BSE frequency were confidence in an ability to detect a lump (Assaf, Cummings, Mettlin, and Marshall, 1985; Bennett et al., 1983; Champion, 1989; Keller, George, & Podell, 1980), formal BSE instruction (Bennett et al., 1983; Brailey, 1986; Celantano & Holtzman, 1983; Champion, 1989; Edwards, 1980; Keller et al., 1980; Worden, Constanza, Foster, Lang, & Tidd, 1983), and knowledge about BSE (Champion 1985; Howe, 1981; Lauver, 1989; Roberts, French, & Duffy, 1984; Worden et al., 1983).

Confidence

Keller et al. (1980) studied a convenient sample of 772 patients who were part of a family practice. They report that patients who felt confident about their ability to do BSE were more likely to do it monthly (Chi Square, df not reported, $p<0.005$). They also report that those who had received individual instruction in BSE by a physician were more likely to claim confidence than those who had received group instruction by a physician, individual instruction by a nurse, or group instruction by a nurse.

Bennett et al. (1983) found that confidence in an ability to find a lump was associated with more frequent practice of BSE (Chi Square 49.96, $df=3$, $p<0.001$) and that this confidence was associated with having been shown how to perform BSE (Chi Square 157.2, $df=4$, $p<0.001$). Reading about BSE, on the other hand, was not associated with confidence.

In a study by Champion (1989), confidence was measured by three questions: how confident women were in their ability to do BSE, whether they thought they could find breast cancer by doing BSE, and their ability to detect breast lumps each time they examined themselves. While the first and third questions seem to address the issue of confidence in one's ability, the second question is more closely related to confidence in the screening doing what it is suppose to do— detect breast cancer. One must question what a measure of confidence in BSE performance that is comprised of answers to these three questions is actually measuring. Be that as it may, Champion found that confidence was highly correlated with BSE frequency ($p<0.001$).

Edwards (1980) studied a convenient sample of 146 women attending a cervical cancer screening program and found that those with confidence in their ability to discover breast lumps were more likely to do BSE (r=0.38, $p<0.001$)

Assaf et al. (1985) studied the use of three approaches to BSE teaching with a convenient sample of 463 women who attended a cancer screening clinic in the United States. The women were randomly assigned to one of three training methods: a pamphlet, a video plus a pamphlet, and training on a breast model plus a pamphlet. They found that a greater proportion of women in the group trained using the model were confident in their ability to do BSE than women in the other two groups ($p<0.01$). They also found that women trained on the model were more likely to do monthly BSE than women from either of the other groups (r=0.23, $p<0.01$).

Formal instruction

Edwards (1980) developed a BSE educational program that incorporated the principles of modelling, guided practice, self-monitoring, and peer support. To test the usefulness of these principles, she randomly assigned 130 women volunteers who were participating in a cervical cancer screening program to one of four treatment groups: one based on modelling only, one based on modelling plus self-monitoring, one based on modelling plus peer support, and one based on modelling plus guided practice. She reports that while the BSE practice in all groups increased (significance not reported), indicating the benefit of instruction, there was no difference in the BSE practice rates between the groups after the program.

Keller et al. (1980) found that individuals who received instruction in BSE by a physician were more likely to feel confident in their ability, but this finding was not significant. Bennett et al. (1983) found that regardless of their level of education, women who had read about or been shown how to do BSE were more likely to do BSE (Chi Square 49.7, df=3, p<0.001).

Celantano and Holtzman (1983) found that 63% of those who reported doing BSE sometime during the past year had received instruction in BSE from a health professional (Chi Square, df not reported, p<0.05). They also note that those who had been asked to demonstrate proficiency to the instructor were more likely to do BSE (Chi Square, df not reported, p<0.05).

Worden et al. (1983) studied 923 women in various women's organizations in the northeast United States. They investigated three alternative methods for motivating women to do BSE. Slide/tape presentations were developed using one of three approaches:

1. the modern woman approach, which was a matter-of-fact approach that talked about the breast as the site of a common cancer, thus warranting regular checking;
2. the physician-patient approach, which showed the traditional physician giving a gentle reminder to keep up with BSE; and
3. the relative risk approach, a simple statistical discussion about the importance of early detection.

Regardless of which presentation was viewed, there was a significant increase in monthly BSE for all women in this study (p<0.001). This change was attributed to the presentation of information within a favourable climate (i.e., a group of friends).

Brailey (1986) studied a convenient sample of 154 female office staff in south central Canada. This study consisted of three groups: one that was offered no teaching on BSE, one that was offered group teaching, and one that was offered individual teaching. By comparing pre-intervention self-reports with post-intervention self reports of BSE, Brailey found that teaching was effective in increasing BSE (Chi Square 5.9, df=140, p<0.05) but that there was no difference between the two formats.

Champion (1989) found that individuals who had been taught BSE by a physician did BSE more often and were more proficient than those not taught by a physician (Mann Whitney U p<0.001). The internal consistency of the proficiency scale using Cronbach's alpha was 0.73, but the number of items in the scale is not reported.

Knowledge

Howe (1980) reports that women with higher BSE knowledge scores were more likely to do BSE than women with lower BSE knowledge scores (Chi Square 38.8, df=24, p=0.03). Schlueter (1982) administered a questionnaire designed to measure knowledge and beliefs regarding BSE as well as BSE frequency to a convenient sample of 263 women who were members of sororities or the Y.W.C.A. The questionnaire was adapted from the one developed by Stillman (1977). Schlueter found no relationship between either knowledge or beliefs regarding BSE and BSE frequency. Worden et al. (1983) found that following their intervention knowledge increased in both those who did and did not do BSE. They conclude that knowledge was necessary but not sufficient to bring about regular BSE.

Roberts, French, and Duffy (1984) studied a random sample of 819 women from two large Scottish cities. They report that women who did BSE had higher mean BSE knowledge scores than women who did not do BSE (p<.0001).

Champion (1985) studied a convenient sample of 301 women from various women's organizations in a large midwestern city in the United States. She found that there was no relationship between knowledge and BSE practise.

Lauver (1989) randomly assigned a convenient heterogeneous sample of 204 women to one of four instructional groups:

1. one that received basic information on BSE;
2. one that received tactile sensory information in addition to the basic information;

3. one that received information about coping techniques that would minimize the likelihood of false positive screening results in addition to the basic information; and
4. one that received both the tactile and the coping information in addition to the basic information.

She found that BSE frequency increased following the intervention, regardless of the informational condition (F(2,366)=174.56, $p<0.001$). She also notes that those who had done BSE prior to the intervention were more thorough in the examination after the intervention, particularly if they received the sensory information ($p<0.05$).

Summary

The findings related to educational variables are probably the most consistent of any studied in relation to BSE. Despite the variations in operational definition and operationalization of confidence, formal instruction, and knowledge, these three variables were almost always associated with regular BSE practise. However, Worden et al. (1983) noted it would appear that while these variables are necessary they are not sufficient to ensure BSE practise.

Health Care System variables

Supportive physician

Walker and Glanz (1986) considered the relative ability of a variety of variables to predict BSE frequency. They found that the extent to which a woman's physician had encouraged her to do BSE accounted for almost half of the total variance (16.6%).

Health Belief Model

The Health Belief Model (HBM), usually attributed to Rosenstock (1966), was originally developed within the Behavioral Science Section of the US Public Health Service by Hochbaum, Leventhal, Kegeles, and Rosenstock. The HBM is based on social psychological theory, most notably that of Lewin (1935), and draws heavily on the definition of health behaviour initially proposed by Kasl and Cobb (1966), which included both activities undertaken for the purpose of prevention and early detection. This view is primarily concerned with the influence people's perceptions had on their health behavior. In this model, four categories of beliefs thought to contribute significantly to the prediction of health behaviour are identified: perceived seriousness, perceived susceptibility, perceived benefits, and perceived barriers. The first two relate to readiness to act; whereas, the last two concern the extent to which a particular action is believed to be beneficial in reducing the threat of a health problem. The level of readiness is thought to provide the energy to act, and the perception of benefits compared to barriers is thought to provide the path of action. The health behaviour itself is thought to be triggered by a cue which can be either internal (e.g., perceived body state) or external (e.g., suggestion from physician). Low levels of readiness are thought to require an intense cue, while higher levels of readiness are thought to require a less intense cue. These four categories of beliefs, together with a satisfactory cue are thought to interact with modifying factors (demographic characteristics, relationship with physician, and past experience with illness) and influence health behaviour decisions. A fifth category of beliefs related to health motivation was added later by Becker, Maimon, Kirscht, Haefner, and Drachman (1977).

The HBM was the result of a series of studies conducted in the late 1950s and early 1960s in the area of health behaviour. Four of these were retrospective (Flach, 1960; Heinnzelemann, 1962; Hochbaum, 1958; Kegeles, 1963a), and three were prospective (Kegeles, 1963b; Leventahl, Hochbaum, & Rosenstock, 1960; Rosenstock, 1965). Rosenstock (1966) states that while none of the studies alone was convincing, together they provided strong support for the model (p. 104).

One of the key problems with research based on the HBM has been the way in which the key constructs were operationalized, particularly during its early development. For example, Kegeles, Kirschat, Haefner, and Rosenstock (1965) conducted a retrospective study of a national probability sample (1,493 non-institutionalized adults 21 years or older of whom 59% were women). In this study, women were asked if they had ever had any special tests for cancer at their doctor's office or some other place. Those who answered in the affirmative were asked additional questions, including the type of test taken. These investigators report that a greater proportion of young women had received Papanicolou tests compared to older women and that this practice was also more common among those with higher education, income and SES. Statistical testing of the differences between those who received testing and those who did not was not reported. The authors also asked four questions to ascertain the degree to which the women believed in the benefits of early detection:

> 1. If you were to get cancer, how do you think you would find out you had it?
> 2. In your opinion, would checkups show that a person had cancer before the person himself could notice that something was wrong?
> 3. In your own case, do you think you would find out from a doctor or a clinic that you had cancer before you knew yourself that something was wrong?
> 4. If a person found that he had cancer, would it make any difference if he started treatment immediately or waited 6 months to a year?
>
> (Kegeles, Kirschat, Haefner, & Rosenstock, 1965, p.818)

The authors found that 48.2% of the women who believed in the benefits of early detection, as measured using the above questions, reported obtaining Pap tests; whereas, 72.5% of those who did not believe in the benefits of early detection did not obtain Pap tests.

There are several difficulties with these findings. First, no reliability testing for the questions was reported. Second, one must question whether these questions really measure a person's belief in the benefits of early detection. A belief in professional judgement (as opposed to self-diagnosis of symptoms) was considered to indicate a belief in the benefits of early detection. One must ask whether these questions do not more appropriately indicate the degree of medical (as opposed to self) dependence. To base a study of an early detection health practice, which is dependent on a woman's judgment about whether a problem requiring medical assistance exists, on a model that denigrates a person's ability to make decisions regarding their health is illogical. In addition, these authors note that since the study was retrospective in nature it was impossible to impute causality. For example, it may have been that belief in the "benefits of early detection" (medical dependence) developed as a result of undertaking an early detection health behaviour.

The HBM has served as the basis for a wide variety of health behaviour studies. Kaufer, Rabkin, Syrotuik, Boyko, and Shane (1986) used the HBM in their study of predictors of success in a smoking cessation program. Glasgow, McCaul, and Schafer (1986) used the HBM to examine barriers to regimen adherence among insulin-dependent diabetics. Both provided limited support for the HBM.

The HBM was the first recognized model to be used in studies of BSE frequency. In repeated analyses of the readiness factors, a few investigators found a modest positive association between perceived susceptibility to breast cancer (Calnan & Rutter, 1986; Redeker, 1989; Walker & Glanz, 1985). The rest of these studies found no association between perceived susceptibility and BSE frequency (Bennett et al., 1983; Champion, 1985, 1987; Hill, Gardner, & Rassaby, 1985; Howe, 1981; Stillman, 1977; Trotta, 1980) or perceived severity of breast cancer (Champion, 1985, 1987; Hill et al., 1985; Trotta, 1980;). Trotta (1980), Champion (1985, 1987) and Hill et al. (1985) found that barriers to BSE were negatively associated with frequency of BSE. While some researchers found a modest positive association between perceived benefits and BSE frequency (Brailey, 1986, Hallal, 1982; Hill et al., 1985; Walker & Glanz, 1986), others found no relationship (Calnan & Rutter, 1986; Schlueter, 1982; Stillman, 1977). Lashley (1987) found a positive association between perceived barriers and BSE frequency. The relationship between health motivation and BSE has not been studied as frequently as the other constructs in the model, but Champion (1985, 1987) found that it was associated with BSE frequency. Hill et al. (1985) studied health motivation in relation to intention to do BSE and found that it did not contribute significantly to the prediction of BSE frequency.

Stillman (1977) designed a questionnaire to measure perceived susceptibility to breast cancer and perceived benefits to doing BSE. No measure of perceived severity was obtained in this study as the investigator assumed all women would consider breast cancer to be very serious. Stillman found that while approximately 33% of the subjects had high belief (thought themselves to be above average in their susceptibility to breast cancer and belief in the benefits of doing BSE) and practice scores 25% had high belief scores but never practised BSE. She also notes that 10 of the 14 women who thought they were high-risk for breast cancer did BSE monthly. Of those who thought they were below average risk for breast cancer, 35% did BSE monthly, and 35% did not do BSE at all.

Trotta (1980) found that only perceived barriers significantly contributed to the prediction of BSE compliance. The greater the perception of barriers, the less likely the women were to practice BSE. Perceived barriers explained 12.2% of the variance in BSE compliance.

Howe (1981) found no relationship between BSE frequency and perceived breast cancer risk. This is particularly interesting since the population of interest in this study was women who were defined as being part of a population that were at increased risk for developing breast cancer. She notes that the women in her study typically believed that they were not at risk for developing breast cancer.

Schleuter (1982) administered a modified version of Stillman's (1977) instrument to a group of 263 young, well-educated married women and found no relationship between health beliefs and BSE frequency. Hallal (1982) used the instrument designed by Stillman (1977) along with the Multidimensional Health Locus of Control Scales (Wallston, Wallston, &DeVellis, 1978) and a measure of self-esteem (Fitts, 1965) to identify predictors of BSE. Based on stepwise multiple regression, she found that self esteem was the best predictor of BSE but that perceived benefits entered the model at step 2. Perceived benefits were significant at $p<0.01$ and explained 8.2% of the variance in BSE frequency.

Bennett et al. (1983) notes that neither the belief that one is at high risk for breast cancer nor a personal history of breast disease was associated with an increase in BSE frequency. Champion (1985), having developed an instrument to measure the central constructs of the HBM, studied the responses of a heterogeneous convenience sample of 301 women. She found that while the variables of the HBM explained 26% of the variance in BSE frequency, perceived barriers alone accounted for 23% of the variance. Perceived benefits, susceptibility, and seriousness did not add a significant amount to the prediction of BSE frequency. Those women who reported few barriers to doing BSE were more likely to practice BSE regularly, as were those with high health motivation scores.

Hill, Gardner, and Rassaby (1985) studied factors predisposing a convenient sample of 123 women between 18 and 70 years of age to take precautions against breast and cervix cancer. The majority of the women were married and had completed high school. The purpose of this study was to determine the relative utility of the HBM, the Theory of Reasoned Action, and the Subjective Probability Model in predicting BSE intention. Only the results related to the HBM will be discussed at this time. The remainder will be discussed below in the section on the Theory of Reasoned Action. Based on multiple regression analysis, the investigators report that only perceived benefits ($p<0.04$) and perceived barriers ($p<0.001$) contributed significantly to the prediction of intention to do BSE in the future. However, these two variables accounted for only 20% of the variance in BSE intention. Results related to the relationship between intention and BSE frequency were not reported. The investigators note that the developers of the HBM never specified the combinatorial rules for the model, and thus, it has been treated as a linear additive model in the past. In an effort to explain a greater proportion of the intention to do BSE, Hill et al. (1985) developed three alternative multiplicative models. They found, however, that no matter how they arranged the variables they could not account for more than 21% of the variance in BSE frequency.

Walker and Glanz (1986) note a weak but significant positive correlation between perceived susceptibility and BSE frequency (r=0.16,$p<0.001$); however, when perceived susceptibility was entered into a stepwise multiple regression along with a number of other variables it failed to make a significant contribution to the prediction of BSE frequency. The HBM constructs, in the form of 2 composite variables, contributed to the prediction of BSE frequency after four other variables were entered. The strongest predictor was the extent to which a woman's physician had encouraged BSE, followed by normative beliefs, instruction in BSE, general evaluation of health care received, and HBM composite variables. Both composite variables were significant at the $p<0.01$ level. The first variable was composed of perceived susceptibility minus perceived severity multiplied by the perceived benefit score. The second variable was derived by multiplying the perceived cost/benefit of using preventive health services by the perceived desirability of doing BSE.

Calnan and Rutter (1986) studied a convenience sample of 1134 women who were participating in a nation-wide program in Great Britain to evaluate the benefits of BSE. A group of 540 women were invited to classes on BSE at which they were taught how to do BSE in detail. Of these, 278 women attended. A second group of 594 was not offered the classes. The investigators used the instrument designed by Stillman (1977) in the study described above. This instrument was administered to the first group before and after the classes on BSE and on two occasions one year apart to the second group. They found that for both groups' susceptibility and benefit scores entered a stepwise multiple regression, where BSE frequency was the dependent variable, at either step one or step two and were significant ($p<.01$); however, the proportion of variance explained remained small (25%).

Brailey (1986) used a modified version of the instrument developed by Stillman (1977). While there was no relationship between BSE frequency and perceived susceptibility, those who perceived greater benefits from doing BSE were more likely to practice it on a regular basis.

Based on previous work (Champion, 1984), Champion (1987) slightly modified her scales for measuring susceptibility, seriousness, benefits, barriers, and health motivation and added four items to measure perceived control. Internal consistency using Cronbach's alpha ranged from 0.63 to 0.76, and test-retest reliabilities, using Pearson *r*, ranged from 0.47 to 0.62. Champion found that perceived barriers accounted for 22% of the variance in BSE frequency and that the remaining variables failed to make a significant contribution to the prediction of BSE frequency. She also found that the variables correctly classified 54% of the women according to their BSE frequency.

Lashley (1987) used the instrument developed by Champion (1984) to assess the relationship between beliefs and BSE frequency among a group of elderly women. She found only weak support for the model, with 94% of the variance remaining unexplained. An unexpected finding in this study was that women who perceived greater barriers to doing BSE actually did it more often. Lashley notes that this variable explained 6% of the total variance in BSE frequency.

Rutledge (1987) used a model in which the variables of the HBM were analyzed along with a set of modifying factors: age, social network, and self-esteem. The HBM constructs were measured using a modified version of Champion's instrument. In a stepwise multiple regression, only a composite variable comprised of the perceived benefit score minus the perceived barrier score was significant, accounting for 27% of the variance.

Redeker (1989) developed a model that combined the HBM and locus of control, and used the instrument developed by Stillman (1977) to measure the HBM constructs. She found by using stepwise discriminant function analysis the HBM constructs explained 12.5% of the variance in BSE frequency. The mean health belief scores of those who did BSE monthly and those who did not do it at all were significant ($p<0.01$).

Summary

There are many problems with these studies. First, only the study by Howe (1981) and Walker and Glanz (1986) were based on random samples. Neither of these, however, could be said to represent a typical community.

Second, as has been noted above, the way in which the constructs were operationalized varied from one study to the next. While several of the study results were based on data from the same instrument, other investigators developed their own questions. In the latter case, testing for stability and internal consistency was seldom undertaken.

Third, the studies failed to consider one of the key assumption of the HBM in their design. According to the HBM, certain attitudes are precursors of health behaviour. Thus, in order for the model to be supported, it must be shown that the attitudes come before the behaviour. This point was recognized by the early developers of the HBM and was the rationale for conducting prospective studies. With the exception of the study by Calnan and Rutter (1986), all of the studies of BSE based on the HBM collected data on attitudes and behaviour simultaneously, making it impossible to determine whether a causal relationship between attitudes and behaviour existed or not.

As can be seen in Table 4, the contribution of the HBM to an explanation of BSE frequency is limited. The findings concerning perceived benefits and barriers, however, were the most consistent. In most cases, one or the other or some combination of the two were associated with BSE frequency, but the proportion of explained variance remained small. These finding suggest that the benefits/barriers construct is partially responsible for the decision to do BSE or not. The inconsistencies in findings can be explained primarily by the way the constructs were operationalized since, generally speaking, the investigators using the same instrument came to similar conclusions.

Table 4

Findings regarding the constructs of the HBM and the frequency of BSE

Study	HBM variable				
	Susceptibility	Severity	Benefits	Barriers	Motivation
Stillman* (1977)	N***	n/a***	N	n/a	n/a
Trotta (1980)	N	N	n/a	Y***	n/a
Howe (1981)	N	n/a	n/a	n/a	n/a
Schleuter* 91982)	N	n/a	N	n/a	n/a
Hallal* (1982)	N	n/a	Y	n/a	n/a
Bennett et al. (1983)	N	n/a	n/a	n/a	n/a
Champion**(1985)	N	N	N	Y	Y
Hill et al. (1985) intention	N	N	Y	Y	N
Walker and Glanz (1986)	Y (comp)	Y (comp)	Y (comp)	Y (comp)	n/a
Calnan and Rutter* (1986)	Y	n/a	Y	n/a	n/a
Brailey* (1986)	N	n/a	Y	n/a	n/a
Champion** (1987)	N	N	N	Y	N
Lashley** (1987)	N	N	N	Y	N
Rutledge** (1987)	N	N	Y (comp)	N	n/a
Redeker* (1989)	Y	n/a	Y	n/a	n/a

*studies utilizing Stillman's instrument, **studies utilizing Champion's instrument, comp means composite, ***Y — positively associated, N — not associated, n/a — not studied or reported

Health Locus of Control Theory

A second model used to understand BSE practice was Health Locus of Control Theory (HLCT) (Wallston, Wallston, & DeVellis, 1978; Wallston, Wallston, Kaplan, & Maides, 1976). Based on Rotter's Social Learning Theory (1954), HLCT postulates that the potential for a health behaviour to occur is a joint function of the expectancy that the behaviour will lead to some particular reinforcement in that situation and the value of that reinforcement. Individuals whose reinforcement comes from within themselves are considered to have internal locus of control (called *internals*). Those whose reinforcement comes from outside themselves are considered to have external locus of control (called *externals*). This particular framework has been subject to misunderstanding from the outset. It is not uncommon to find *internals* defined as those who believe that they are responsible for their health and *externals* defined as those who believe that their health is determined by chance, fate, or persons or events beyond their control. Based on Rotter's work, a scale specific to locus of control as it related to health was developed by Wallston et al. (1976). This scale was later revised in recognition of the multidimensional nature of the external portion of the construct (Wallston, et al., 1978). At that time, the external scale was divided into two subscales (*chance* and *powerful other*). Health locus of control has been shown to predict intentions related to preventive health behaviours such as exercise, brushing teeth, and drinking alcohol (Kristiansen & Eiser, 1986).

McCusker and Morrow (1979) examined the relationship between health locus of control, health beliefs, and health behaviour. They administered a questionnaire containing Stillman's (1977) HBM items, a set of demographic questions, and the original 11-item HLCT scale to 543 school personnel who were part of a program designed to test the effectiveness of teaching the importance of prevention and early detection in cancer of the lung, colon, breast, and cervix. The program was presented to 241 staff members, with the remainder (302) being a control group. The investigators found that among those who participated in the programs *internals* were more likely to report monthly BSE practise three months later than *externals* (p<0.05).

Hallal (1982) used a questionnaire comprised of Stillman's (1977) HBM items, the revised Multidimensional Health Locus of Control Scales (MHLCT scale) (Wallston et al., 1978), the Tennessee Self-Concept Scale (Fitts, 1965), and a set of demographic questions to look for predictors of BSE practise in adult women. A convenient sample of 207 women was recruited from a variety of settings. She found that the *Powerful Other* score entered a stepwise multiple regression at step three (after Total P from the Tennessee Self-Concept Scale and Perceived Benefits from the HBM) and was significant at the 0.01 level. However, the variables from the first three steps of the analysis only accounted for 16% of the variance.

Redeker (1988) distributed questionnaires comprised of Stillman's (1977) HBM items, the MHLCT scales (Wallston et al., 1978), and a set of demographic items to a convenient sample of 137 mothers of children at three private preschools. The women ranged from 26 years to 44 years of age. She found that health beliefs, internal locus of control, occupation, and religion explained 47.5% of the variance in BSE practise but that only the health beliefs score made a significant contribution to the prediction of BSE frequency (p=0.02). Using the four variables outlined above, 64.58% of the subjects were correctly classified according to their BSE frequency.

Summary

The studies based on HLCT had the advantage that both the original and revised scales were tested for reliability and validity extensively during their development. *Internal* health locus of control was found to be positively correlated with health status (p<.0001), and *chance* health locus of control was found to be negatively correlated with health status (p<0.01) (Wallston, et al., 1978). In addition, the investigators of BSE pretested the instruments on the populations they studied. McCusker and Morrow (1979) report that the test-retest reliability of the original scale was 0.69. Hallal (1982) found the revised instrument was also relatively stable (Internal scale 0.688, Powerful Other scale 0.745, Chance scale 0.687). Redeker (1989) reports an alpha coefficient of 0.637 for Stillman's (1977) HBM instrument and acceptable values for two of the MHLCT scales (Internal scale 0.665, Chance scale 0.685). The Powerful Other scale data was excluded from further analysis due to the low internal consistency with Redeker's sample (0.165).

The studies based on HLCT were plagued by some of the other problems seen earlier. The samples in these studies were fairly homogeneous and small. Because they were convenient samples, they were likely unrepresentative of the communities from which they were drawn. The retrospective design, common to all of the studies that used HLCT for a theoretical base, again made it impossible to determine whether a causal relationship between locus of control and BSE practice was present.

Theory of Reasoned Action

A third model used in an effort to understand BSE practice was the Theory of Reasoned Action (TRA) developed by Ajzen and Fishbein (1980). According to this approach, behaviour is a function of one's intention to perform the behaviour. Intention is determined by two additive components: attitudes toward the behaviour and subjective norms. The attitude component is a function of the beliefs concerning the likelihood that specific consequences follow the behaviour in question and the favourable or unfavourable evaluation of those consequences. The subjective norms component is a function of the perceived social pressures to engage in a particular behaviour and the motivation to comply with those expectations. Thus, according to TRA, a woman would practice BSE if she viewed BSE as useful in obtaining desired consequences and as being worthwhile in the eyes of individuals she wished to please.

Like the HBM, the TRA has also been used as the theoretical framework for a number of health behaviour studies such as family planning practices (Fishbein, Jaccard, Davidson, Ajzen & Loken, 1980). A number of advantages of the TRA over the HBM have been noted (Lierman, Young, Kasprzyk, & Benoliel, 1990):

1. the mathematical relationships between the model components are specified;
2. there are specific instructions for operationalizing the constructs of the model;
3. instrument development is grounded in the target population; and
4. the inclusion of a social normative component.

Hill et al. (1985) developed a questionnaire to measure the constructs of the TRA using the method specified by Ajzen and Fishbein (1980). Based on multiple regression analysis, they report that only the attitudinal component significantly contributed to the prediction of intention to do BSE ($p<0.001$), and this component explains 17% of the variance.

The relevance of the Subjective Probability Model (SPM) for predicting intention to do BSE was also examined by Hill et al. (1985). According to this model, intention can be predicted by any single salient belief and pairs of subjective conditional probabilities (Jaccard, Knox, & Brinberg, 1979). This model yields a variable called psychological relevance. In this study, individuals were asked to respond to questions such as, "How likely is it that you would do BSE supposing it would (would not) stir up worries about breast cancer?" Individuals were asked to respond using a 7-point scale ranging from extremely unlikely to extremely likely. The belief statements were derived from the preliminary work involved in developing the questionnaire for the TRA portion of the study. The highest correlations between intention as determined using the belief statements and intention measured directly were for "provides reassurance about cancer," "provides a sense of relief," and "provides a sense of control over cancer." All of these were significant at the 0.001 level or greater. According to the investigators, this information was of practical interest since, according to SPM, a change in the most relevant beliefs would lead to the greatest changes in intention. It should be noted that the relationship between intention to do BSE and BSE frequency was not reported in this study.

Champion (1989) developed a model based on the TRA and three other variables: the method by which a person was taught to do BSE, their confidence in their ability to do BSE, and their knowledge of BSE and breast cancer. The independent variables were knowledge, method of teaching, confidence, attitude toward BSE, and social norms. Champion developed a direct (called affect) and an indirect (called attitude) measure of attitude toward BSE as well as a direct (called global social norm) and an indirect (called social norm) measure of social norms. The dependent variables were intent to do BSE, frequency of BSE, and proficiency in BSE. She found that knowledge correlated with intent ($p<0.01$) and social norms ($p<0.001$) were related positively to knowledge. No comment was made regarding correlations between these variables and BSE frequency. Champion found, however, that while social norms were correlated with intent ($p<0.001$) they did not correlate significantly with frequency.

Hill and Shugg (1989) developed a questionnaire based on both HBM and TRA as part of a study to determine predictors of BSE among a group 654 Australian women. The sample included 117 breast cancer patients, 209 women with benign breast disease, and 329 women attending general practitioners for conditions unrelated to the breast. The sample included women ranging from less that 30 years to those over 70 years of age as well as those with varying levels of education and marital status. They found that women in the benign disease and breast cancer groups had significantly greater intentions to do BSE that those in the control group ($p=0.001$). They also note that those in the control group were more likely to indicate that failure to do BSE was associated with laziness or forgetting ($p=0.001$), while in the other two groups, failure to do BSE was associated with fear of finding a lump ($p=0.003$). Based on preliminary analysis, four additional composite variables were created: emotional incentives (e.g., BSE leads to reassurance), emotional barriers (e.g., fear of finding a lump), cognitive barriers (e.g., not knowing how to do BSE), and personal disorganization (e.g. forgetting). In a stepwise multiple regression, intention, cognitive barriers, personal disorganization, and being a breast cancer patient were significant predictors of BSE practice, explaining 32% of the variance of BSE frequency. Intention was the strongest predictor (p=0.0001), and status as a breast cancer patient was the weakest (p=0.0002). Hill and Shugg then used the same method to determine the predictors of intention. They found that attitude toward BSE, previous BSE practice, emotional incentives, personal disorganization, group (breast cancer, benign breast, control), cognitive barriers, emotional barriers, and social referents explained 54% of the variance in BSE intention.

Lierman, Young, Kasprzyk, and Benoliel (1990) studied a convenient sample of 93 women recruited from various women's organizations. They ranged from 52 to 90 years in age, and most of them were married with at least a high school education. Attitude toward BSE and social norms, the indirect measures of the model components, accounted for 32% of the variance in intention. The direct measures, affect and global social norm, accounted for only 21% of the variance in intention. However, only the attitudinal component of the model was a significant predictor (p<0.001) of intention. Since the model postulated a relationship between intention and behaviour, attitude and social norms were regressed on BSE performance, accounting for 39% of the variance in BSE frequency. In this case, both the attitudinal (p<0.001 for both direct and indirect measures) and the social normative components (p<0.01 for social norms and p<0.05 for global social norms) were significant predictors. The investigators divided their sample into two groups: those who did BSE up to three times in the last 6 months, and those who did BSE between four and six times in the last six months. They found that the frequent performers had a more positive attitude toward BSE and stronger social normative influences. Using discriminant function analysis based on these two variables, Lierman et al. were able to correctly classify 76.34% of their sample.

Summary

The studies using the TRA were plagued by one of the key problems noted earlier: differences regarding the way in which some of the variables were operationalized. The TRA specifies exactly the way in which scales to measure the independent variables are to be constructed. Thus, according to this theory, the questions used to assess intention would vary from one study to the next. However, when the study is being conducted in order to assess behaviour, as opposed to intention it would be useful if the dependent variable was defined in the same way. This was not the case. For example, Hill and Shugg (1989) categorized their sample as follows: not at all, once every 2 or 3 months, or monthly. On the other hand, Champion (1989) categorized hers as follows: more than once a month, monthly, every other month, every three to four months, every 5 to 6 months, less that every 6 months, and not at all. Variations like these make comparisons between findings difficult.

The second area of concern is related to the stability and internal consistency of the instruments used in these studies. The questionnaire used by Hill and Shugg (1989) was not tested for stability or internal consistency. Champion (1989) reports Cronbach's alpha levels of greater that 0.7 for the measures of intent, affect, attitude, social norms, and proficiency but no stability testing. Lierman et al. (1990) also report Cronbach's alpha levels of greater that 0.7 for all measures but no stability testing. It would be important to know how stable the scales were since instability could be partially responsible for the low levels of explained variance in intention and BSE frequency.

Third, according to the TRA, attitudes toward a health behaviour and perceived social norms regarding the practice are precursors of intention to engage in the behaviour, which in turn is predictive of behaviour itself. Thus, as discussed above in the section on the HBM, in order for the model to be supported, it must be shown that the attitudes did indeed come before the intention and the behaviour. All of the above studies, however, were retrospective, making the establishment of a causal relationship impossible.

Fourth, according to the TRA, the direct measures of attitude and social norms should be better predictors of intention and behaviour than the indirect measures. In the study by Lierman et al. (1990), however, the indirect measures were better predictors of both intention to do BSE and BSE frequency. The investigators attributed this to the use of an affect scale with only four items, but this is unlikely since the scale was found to be very consistent (Cronbach's alpha was 0.82).

In general, it can be seen from the above analysis that while the constructs included in the TRA are somewhat better at explaining the variance in intention to do BSE and BSE frequency the proportion remains modest. In addition, the lack of any prospective studies using the TRA means that, regardless of the findings above, support for the model as originally specified by Ajzen and Fishbein (1980) is minimal.

Conclusion

As a result of the proceeding analysis, several points become apparent. None of the models have been tested in a manner that would allow causal relationships between their components and BSE frequency to be discovered. The studies used retrospective designs while postulating that certain attitudes were precursors to behaviour. In addition, only a few studies used samples that would permit generalization of findings to a larger community.

Only three variables have been consistently associated with BSE: self-esteem, formal instruction in BSE, and perceived benefits/barriers to BSE. None of the models used to date have been able to explain more than a small proportion of the variance associated with BSE frequency. These results might be due to a variety of problems associated with the definition and operationalization of key constructs as well as flaws in the models themselves.

These findings raise the question of the validity of the models used to date. Studies based on selected demographic variables and/or the HBM, TRA, and HLCT have never been particularly conclusive, and yet, investigators have attempted repeatedly to rearrange the constructs in some way to explain a greater proportion of the variance in BSE frequency. Perhaps none of these models are appropriate for understanding BSE.

To test this hypothesis, a new model was derived inductively. The remaining chapters will describe the methods used and the results of an initial validation study.

CHAPTER III: DISCOVERING AND UNDERSTANDING FACTORS ASSOCIATED WITH DOING AND NOT DOING BREAST SELF-EXAMINATION

Introduction

This study had three phases: a qualitative model-development phase, a quantitative instrument-development phase, and a quantitative model-validation phase. As such, it was an example of a qualitatively-driven design using sequential triangulation (Morse, in press). Triangulation was used historically to more accurately calculate some particular location by using several reference points and principles of geometry. Its primary use in research is to ensure that a more comprehensive understanding of a research question is obtained by using two or more research methods. Triangulation was used in this manner in the present study. It is also sometimes used to investigate the validity of methods. However, since validity is normally established during a pilot phase, this later approach is less common.

Since the findings of previous studies in this area were inconclusive, a qualitative method (ethnoscience) was used in the first phase of the study to establish a new model. Interviews were conducted with a group of 13 women who responded to a request for informants. A model of factors associated with the doing and not doing BSE was developed from the analysis of this interview data. Given the investigator's long-term interest in obtaining normative data related to the factors identified in the model, key concepts from the model were used as the basis for the development of a set of subscales. Following content validation, these scales were pilot-tested with 24 women separate from the interview sample in order to establish stability, internal consistency, clarity, and length of time required for completion. Since women had indicated during the first phase of the study that "in order to not make the doctor angry" they often told their physician they did BSE when, in fact, they did not, the subscales were also checked for potential social desirability response bias. An instrument containing the revised subscales, the Crowne-

Marlow Social Desirability Index, selected demographic items, and a BSE practise item was then administered to a larger group of women. Analyses were undertaken to determine the degree to which BSE practise behaviour could be correctly predicted by subscale scores and selected demographic variables. These findings will be used as the basis for a study to further refine the model in the future.

The main task in the first phase of the study was to identify categories of factors that were associated, in the minds of women, with doing or not doing BSE.

Description of the method

An ethnoscientific approach was the method of choice for this phase of the study for three reasons. First, although much can be learned from observation, the health practise of interest in this study was normally conducted privately. Thus, other methods requiring observation, such as participant observation, were inappropriate. Second, according to Frake (1962), this technique facilitates the discovery of cognitive structure by examining what people say. Thus, it provides the investigator with a "window" through which to understand the thinking of a particular group. Last, Field and Morse (1985) state that ethnoscience is the method of choice when the aim of the study is to determine the kinds or types of topics of interest (e.g., kinds of actions, types of diseases).

This approach consists of linguistic techniques for identifying aspects of a phenomenon that are meaningful to those who participate in the study. The first major assumption of this technique is that people "make sense" of the world by using patterns of behaviour that are consistent and shared through culture. These patterns are found by conducting unstructured, interactive interviews and analyzing them using comparative questions and card sorts (Field & Morse, 1985; Spradley, 1979). During the interview, an investigator using this technique explores some domain of interest with individuals. Questions are asked that identify the domain and begin to define its boundaries. As information is learned, it is placed in the context of what is already known, and subsequent questions are asked. Thus, data analysis begins during the interview *per se*. Data from one interview are analyzed and become the basis for questions with the next informant as well as subsequent interviews with the same informant. A second major assumption of this technique is that because the patterns of behaviour are culturally shared relevant information can be obtained from anyone thoroughly immersed in the culture (Evaneshko & Kay, 1982).

The first task in conducting work of this nature involves discovering culturally relevant questions. While analyzing data from initial interviews, key words or phrases are listed that describe the domain. These key words or phrases are used for card sorts (diadic, triadic, Q-sort) conducted during the second interview. The tape recorder is left on and the informants are asked to think aloud as they work. When finished, the informant is asked to name each pile, identifying similarities and differences between piles, and then the contents of each pile are recorded.

The card sorts assist in identifying the segregates and subsegregates of the taxonomy (see Figure 1). The analysis of the transcript provides the characteristics of each element of the taxonomy. During the third interview, additional information on any area still not well-defined can be obtained, and the taxonomy can be shared with the informants for verification. The distinctive features necessary for membership in each of the categories can then be identified and areas of agreement and disagreement documented. Areas of consistent disagreement are further explored with informants, in order to discover any previously undetected categories.

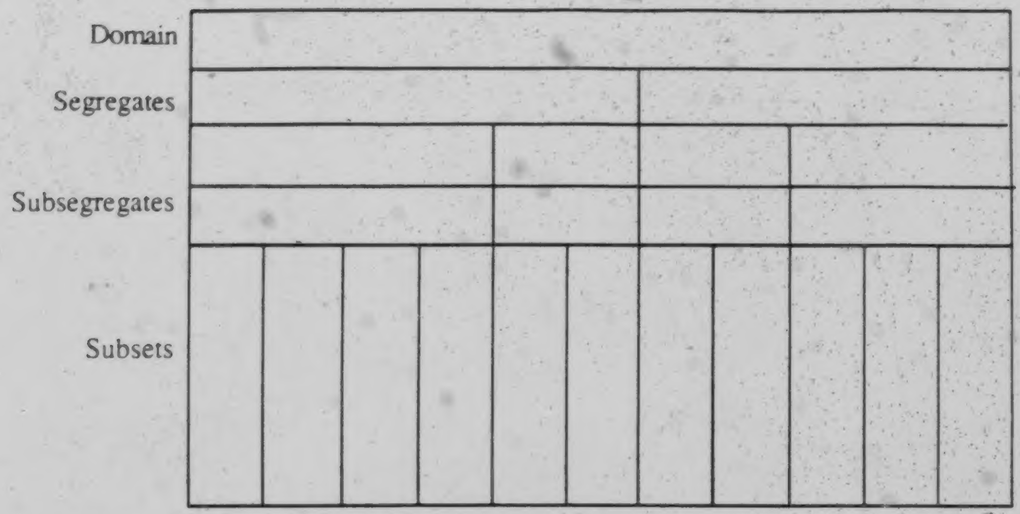

Figure 1: The relationship between the elements in one type of taxonomy.

The taxonomy shows important categories of a domain and thus provides a starting point from which a model representing the cognitive structure of individuals' perceptions or world views is constructed. The model suggests relationships, between concepts based on the taxonomy, for further investigation.

Content analysis of the transcripts is undertaken after each interview . Descriptors of important parts of the interview are noted in the margins of the transcript, and then these are grouped into categories and coded. If categories become very large, then they may be divided and recoded. This analysis forms the basis for a discussion of the context within which the data were found.

There are several issues related to reliability and validity in qualitative research. First, in order for the model to be valid, the sample in a qualitative study must be made up of those who have the knowledge and experience to talk about the subject of interest. Thus, the subjects in a study of this nature are not statistically representative of the population. Rather, it is assumed that by using purposeful sampling technique as well as careful interviewing and data analysis methods the informants, and hence the data, will be representative of the topic of interest.

A second area of concern is the adequacy of the data. Thus, informants are added until no new information is obtained and "negative cases" are actively sought..

The third area of concern is the social context in which data are gathered. Informants may reveal some information in one setting that they would not share in another. For this reason, information obtained in one-to-one situations should be verified with information obtained from other informants in group situations.

A fourth area of concern is the possibility of observer bias. In order to detect this problem, investigators are advised to identify or "bracket" their views on a subject prior to collecting data. In this way, bias in data analysis can be more easily prevented. To further enhance the credibility of the study, excerpts from field notes and transcripts should be used to substantiate the analysis.

Sample selection

The population of interest in this study was English-speaking Canadian women between the ages of 18 to 65 years of age. According to Spradley (1979), the ideal informant is one who is thoroughly enculturated, involved in the culture, prepared to give adequate time, and nonanalytic. Enculturation may take place formally or informally, but, in general, the longer an individual has been involved in a cultural scene, the more thoroughly enculturated he or she will be. Since this study was of a particular health practise in which only women, as opposed to girls, engaged, only those who were defined by society as women, were chosen as potential informants. Thus, it was decided that only those who were at least in their early thirties would be considered for participation in this study.

According to Spradley (1979), current involvement in the culture in question is important because, people who are currently involved in the cultural scene use their knowledge to guide their actions. Once they are no longer involved, their cultural knowledge becomes more difficult to recall. For the purposes of this study, current involvement was viewed as including those who were involved in both the practise and the non-practise of BSE. As all women can be placed in either one category or the other, one category was not recruited deliberately over the other. If it had become clear that the practise or non-practise group was under-represented, additional informants from that group would have been sought, but this further recruitment did not prove to be necessary.

Spradley (1979) notes that selecting informants from an unfamiliar cultural scene was helpful because much of the researcher's cultural awareness lies outside their consciousness. He argues that if one studied an unfamiliar culture they would be more sensitive to things thought to be common place by the "natives". The most productive relationship was thought to be one between an unenculturated interviewer and a thoroughly enculturated informant. The investigator chose to go against this suggested criteria because she wanted to eventually be able to make some social policy recommendations that would be relevant in Alberta. Also, given that BSE is a phenomenon treated with a certain amount of privacy in this culture, it was thought that informants might actually be more willing to discuss it with a woman from their own culture.

Various authors have suggested that informants must be willing to provide between three and seven one hour interviews. It is often difficult to predict beforehand how many interviews will be necessary. Generally, people who are very interested in a study will make time available for it. For this reason, informants were chosen from among individuals who indicated an interest in discussing women's health concerns. The phrase "women's health concerns" was used in an attempt to avoid any bias that might arise if the informants knew that BSE was the investigator's primary interest. It also allowed the investigator to structure early interviews around this broad topic in order to understand the context within which women thought about breast cancer and BSE. Once these women expressed an interest in the study, they were told of the time requirement. Those willing to make the time commitment were considered eligible informants.

Spradley (1979) encourages the use of nonanalytic informants. Those who provided insights into behavior using their own words were thought to be helpful, but those who borrowed social science language were thought to cloud analyses. He argues that the patterns of meaning sought by the ethnoscientist are imbedded in the "insider" words used by informants. While even the best informant may occasionally get off-track and translate their ideas into "outsider" language, they can be gently steered back to the subject at hand by using "native language" questions (questions that ask them to respond as though they were talking to someone inside their cultural group). If an informant were to regularly slip into "outsider" language, however, the extensive native language questioning required would mean that either other questioning techniques would be kept to a minimum or that interviewing would take much longer. In either case, valuable time and information would be lost. There is no way of knowing who will be analytic in their comments until interviewing begins. In selecting the informants in this study, early interviews were reviewed in order to identify those who found it easiest to respond using "insider" language, and these women were considered to be eligible for inclusion as informants.

Initial interviews were conducted with women meeting the above criteria who volunteered to be interviewed following a request for informants in a local newspaper, on a popular talk show, and on posters distributed across the campus of the University of Alberta. Thirteen women with a knowledge of BSE and the ability to clearly describe their thinking about it were eventually retained as informants. The women ranged in age from 31 to 65 years of age and included those who were single, married, separated, and divorced. Education ranged from Grade 5 to some graduate studies. These women represented a broad range of religious affiliations (e.g., Taoist, Anglican, agnostic) and occupational groups (e.g., housewife, student, psychologist, writer, secretary). Seven of them did BSE at least once every three months, while six of them did not. Of those who did BSE, three were over 40 years of age, and four were under 40 years of age. Of those who did not do BSE, three were over 40 years of age, and three were under 40 years of age. Three rounds of interviews were conducted over a period of 6 months.

Prior to the first interview, informants were given an explanation of the study, potential benefits, absence of any health risks, time requirements, and method of data collection. They were also assured of anonymity and the option to withdraw at any time without penalty. Following an opportunity to ask questions, those agreeing to participate were asked to sign a written consent (Appendix I). The name and phone number of the researcher were on the consent form and a copy of it was left with them so that they could contact the researcher at any time.

Data were stored in a locked filing cabinet. The master code, identifying informants, was stored separately in a locked file. All informants gave permission for their taped interviews to be kept for further studies and educational purposes.

Data collection and analysis

Data were collected by tape recording face-to-face interviews with the informants in their homes or in the office of the investigator, whichever was more convenient for the informant. The tape recordings were transcribed and uploaded to the mainframe at the University of Alberta for content analysis using QUAL, a computer program for analyzing qualitative data (see Appendix II).

In order to determine whether the topic of breast cancer or BSE would be voiced spontaneously, initial questions with the first six informants were deliberately general in nature. The questions were based on the investigator's experience as a community health nurse, discussions with dissertation advisors and graduate students in nursing, and clinical work in a local breast clinic. Since no women mentioned these topics voluntarily, questioning in subsequent interviews was focused on the topic of breast cancer. In this context, BSE was readily discussed.

Questions asked during the first round of interviews included "What is it like to do BSE? What goes through your mind when you do BSE?" and "How would you describe the person who does BSE?" A second interview with each of the first eight informants was used in the first round in order to clarify and expand upon the first interview. Sixty-one descriptors were identified (see Appendix III) and placed on cards.

The three cards sorts outlined above were carried out with each of the thirteen women. Once the card sorts were completed, the taxonomies were validated with informants. The validity of the taxonomies was then discussed with groups of graduate nursing students and colleagues in the Faculty of Nursing at the University of Alberta. The final version of the taxonomies appears in Figures 2 and 3.

DO BSE

<table>
<tr><td colspan="12">knowledgeable</td></tr>
<tr><td colspan="7">worth it</td><td colspan="5">in charge</td></tr>
<tr><td colspan="5">might get it 5*</td><td rowspan="4">9
doctor's advice</td><td rowspan="4">6
hypochondriac</td><td rowspan="4">11
hopeful</td><td colspan="4">check on things</td></tr>
<tr><td colspan="2" rowspan="2">others got it</td><td colspan="3" rowspan="2">higher chances</td><td colspan="2">take care</td><td colspan="2">problem consious</td></tr>
<tr><td>8</td><td>3</td><td>6</td><td>10</td></tr>
<tr><td>Heard of someone</td><td>know someone</td><td>older</td><td>previous lump</td><td>family history</td><td>seek information</td><td>have time</td><td>anticipate</td><td>attend</td></tr>
</table>

*numbers correspond to subscale numbers

Figure 2: Taxonomy for the domain (*Do BSE*)

DO NOT DO BSE

knowledgeable	cancer-phobia	1 scared		won't think
				won't hear
				can't look
		2 fatal-istic		can't prevent
				can't detect
	worried but...	3 other priorities		too sick
				too stressed
				too busy
		4		ugly body
	not worth it	5 won't get it		too young
				too healthy
				no family history
				past menopause
		6		roll with the punches
ignorant	don't know enough	7 want to learn more		don't understand
				hard to find out
		8 embar-rassed		too intimate
			won't touch	against upbringing
				don't want responsibility
	never heard	9		not told
		10 don't go		no habit
				no access

*numbers correspond to subscale numbers

Figure 3: Taxonomy for the domain (*Do not Do BSE*).

Women's ideas about breast cancer and BSE

Before discussing the elements of the two taxonomies, it is important to first consider the context from which these ideas emerged.. Words of informants appear in italics. Longer quotations from transcripts are indented. Investigator's remarks are enclosed in square brackets.

Serious and usually terminal

Women consistently viewed breast cancer as a serious and usually terminal illness. The idea of having breast cancer was terrifying. They tended to think of BSE in one of two ways: a way of finding a lump that **may** or **may not** be breast cancer or a way of finding a lump that **probably was** breast cancer. Regardless of the role attributed to BSE, the meaning of breast cancer was the same:

> [you think about] who is going to be there to take care of your kids if you're taken out by cancer? Who is going to make sure that your husband has his lunch made for him at 5:30 in the morning because he sure isn't capable of it?...All the little things. Who is going to be the one who does the volunteer work or gets involved in the community or does everything? You like to think to a certain degree you're indispensable. And it's a pretty strong opponent to come up against. It can take you right out in no time flat. It's scary.
>
> As I see it, it's looking for cancer. I don't see it so much as a preventive measure. I see it as looking for cancer. And I don't like to be looking for cancer, so I really do it — I think if I do it once every five months, that's probably — that's tops...
>
> [And looking for cancer means...?]
>
> Death (long pause).

The thought of having breast cancer brought several women to tears during their interview. As they talked about women they knew who died from breast cancer or the implications of their own deaths for their husbands and children, the women frequently cried quietly.

Treatment is horrible

The treatment associated with breast cancer was viewed with a combination of horror and distaste by most of the women in this study. They talked about the physical side-effects of treatment such as hair loss, nausea, and vomiting as well as the emotional effects such as *how I would be viewed by others* and said that it *would be a very difficult thing to deal with.* They thought of the treatment as *painful* and referred to a mastectomy as an *amputation* and as *mutilating*:

> She just pulled up her T-shirt and pulled a sock or something out of her bra and there was a huge scar. And she had had one breast amputated.
>
> Personally speaking I wouldn't do it, but...unless I was guaranteed 100% it would work. I think it's a form of torture, to be honest. I think...sometimes I think that it's worse than the disease itself.

No distinction was made between the various types of mastectomy (i.e., simple, radical). The women thought society viewed those who had undergone mastectomies of any kind as incomplete persons:

> It would be a loss, a partial loss of what makes me a woman. You know, there are a lot of things that make me a women, but breasts...having a breast removed would be pretty devastating to me...part of me as a woman. Wouldn't be a whole me, but part of me and it would be something I would have to deal with.
>
> I had a customer who had her breast removed, and she was quite mad and annoyed....I'm sure she would rather have had cancer in some other place because she felt she was half missing, you know.
>
> It's mutilation of your body which somehow is really repulsive. It would be like loosing your arm or...I don't know, you can cover it up and stuff, but, it's just the idea that somebody would cut off a piece of my body....It's really repulsive.

The women in this study were especially concerned about the implications of breast cancer treatment on their relationships with their husbands and partners. They thought that those with whom they had intimate relationships would probably adjust to a mastectomy with time, but they were not sure of that:

> Even with a spouse, A. says he would still love me, and yes he would, but there was no way he could make love to me in the same manner. I don't know...it's being incomplete in the sense that someone who has had a limb amputated is incomplete, and they can wear a prosthetic device and function, definitely....I guess when it comes down to a women's one relationships, there is a difference. You take off the little brace, the artificial foot, or you remove the bra and whatever padding or whatever there is, and then you're right down to being you, and you are less than what you were....I don't know how A. would react if it became necessary for me to become less than the woman he married — physically....I don't want to put him to the test.

Not talked about

Another aspect of breast cancer and BSE had to do with the appropriateness of discussing "things like that." Women generally remarked that "we never talked about those things" with friends. "Those things" included anything to do with the breast as well as anything to do with cancer. One woman regularly referred to cancer as "the big C" rather than actually saying the word "cancer". The women generally agreed that discussions regarding breasts and cancer were undertaken privately between mothers and daughters or with a physician, if at all:

> How you ever going to ask anybody about that, love? I don't...like, I'm saying nobody ever said to me yesterday, "Do you do self breast examination?" Because that's like saying, "Are you a widow?"
>
> [It's like...]
>
> It's like I can't talk about that because it's my age that I was never taught to talk about sex or your sexual objects of your body. When I was a child growing up, you know, you weren't suppose to talk about you fed a baby by breast or any thing like that. I mean, that was just a no-no.
>
> [As in not polite?]
>
> Well, its like that was very private language. That was between a grandmother and a mother...but if you'd turned around and said to a bunch of girlfriends, "Hey, I'm going to breast feed" — I'm going back to my generations — they'd have looked at you and said, (gasp) "Why did you swear like that? That is wrong. You're talking about the body. You shouldn't be talking about the body." That's why I'm saying I think it's harder to get through to people my age about breast cancer or any other kind of cancer because it's a no-no to talk about it. It's something that's private.

Even among the younger women in this study, breast cancer and BSE were not readily discussed. Young women talked about discussing matters like birth control with their sisters, female cousins, and husbands, but they said that the topic of breast cancer and BSE "just never came up":

> I mean, well...can you imagine? Coming down to breakfast one morning and saying to your husband, "I did my BSE and everything is O.K." It just would never happen.

This finding was initially alarming because the method of choice for this phase of the study, ethnoscience, required that women talk about their views. Would the cultural rules that governed talking about breasts and cancer prevent women from talking about BSE? Although some of the elements in the taxonomy posed more difficulty than others, the investigator was relieved to find that the women who served as informants in this study were generally able to find words to describe their ideas.

Summary

Breast cancer was generally viewed as a serious and disfiguring disease that often resulted in death. Some of the informants thought prompt treatment could probably save a woman's life, they viewed the treatment as so horrible that "it was worse than the disease itself", and was not something that they would undertake unless they were guaranteed that it would be effective. Others viewed the treatment of breast cancer as equally unpleasant, but they still thought it was worthwhile. Regardless of which group a woman belonged to, she knew that should she find "something" while doing BSE, the future would hold new uncertainties — uncertainties about treatment and perhaps even about life itself. Under other similar circumstances, women might seek support by talking with friends or family members. According to this study, the cultural rules that govern what they can talk about in various social situations frequently prevent women from talking about breast cancer or BSE with anyone, except perhaps close family members and/or their physician. Thus, most women face the potential uncertainties associated with BSE alone. It was from within this context that the taxonomies emerged.

The Domains — *Do BSE* and *Do Not Do BSE*

As can be seen in Figures 2 and 3, two domains were identified, namely *Do BSE* and *Do Not Do BSE*. The elements in each of these domains relate to the characteristics of individuals who either do or do not do BSE.

Do BSE

The first domain, *Do BSE*, consisted of individuals who *knew how* to do BSE. The women in this study agreed that there was *a certain amount of stuff you have to know* in order to do BSE. When questioned regarding whether this included a feeling of being competent, it was generally thought that this was not necessary. In fact, some of those who did BSE admitted that they might miss a lump, but they checked their breasts on a monthly basis anyway:

> If you know what you are looking for — have an idea what you are looking for, then you know if something is there that it could be or it couldn't be, but it should be looked after, like right away. It shouldn't be left to say, "Oh, it's nothing, it'll go away."

This domain had two segregates, *worth it* and *in charge*. The women who thought BSE was *worth it* viewed BSE as a way to find breast cancer in time for effective treatment. Effective treatment included both the ability to detect breast cancer while it could still be cured and the ability to prevent more disfiguring treatment like a radical mastectomy. The women who did BSE because it was *worth it* did so with almost religious zeal. Somewhere in the course of their lives, they had been convinced, usually by a physician, that they *should* do BSE. The importance of BSE in relation to the prevention of treatments like radical mastectomy seemed almost as important as the prevention of one's untimely death:

> I'm aware that it is a means of detecting lumps very soon, and I've been told the sooner I find anything it can be treated and I run less risk of having to go through this radical surgery.

Worth it, had two subsegregates, *might get it* and *hypochondriacs*. Those who thought they *might get it*, came to this conclusion based on the knowledge that *others got it*, or that for some reason, they believed they had a *higher chance* of getting breast cancer:

> All of a sudden you know of somebody that it's happening to, and then you start thinking, "Hey, I better start looking after myself a little bit better."

> Fifty, yes, because they're starting to be the...in some sense of the word, they're starting to be a faded flower....Everything starts going goofy, and you get things that you never had before....They get into their minds again that this could happen to me, where when I was younger, this is never going to happen to me.

The hypochondriacs worried about all aspects of their health, not just whether or not they might get breast cancer. Concerns about their health seemed to overshadow all aspects of their life. They were constantly on the *look out* for problems. They knew many stories about a variety of terrible health problems:

> She is a hypochondriac, is very interested in any part of her body that has anything that could go wrong so she would be right in there making sure that it doesn't. Sort of obsessed with health cares.

The second segregate, *in charge*, was characterized by a sense of being *clued in* to the body and wanting to do all the things that were *good for* it as well as the whole person. Thus, individuals who were *in charge* engaged in various health practices such as BSE for different reasons than those who saw BSE as *worth it*. Some of the informants knew of individuals who had breast cancer, while others did not. They were vague about whether they saw themselves as being at risk and emphasized that for them doing BSE was more related to *looking after* themselves:

> [She would know] what are good things to do for her body and for...not just her body but all of her self, like her spiritual self and her intellectual and emotional selves and her physical self...how to treat her self as a whole person and in a health manner.

This segregate also had two subsegregates: *hopeful* and *check on things*. *Hopeful* women were surprised that their future was so bright and were propelled into that future by their hopes and dreams. They wanted to make sure that they lived long enough to be part of the future that they imagined for themselves:

> For, oh, eight years I was a postal worker. And this is a dirty job. It is a job where I felt like I was being a slave in a slave driving place, and I quit work, got married, and had a child and still didn't feel like a whole person. That there was more meant for me than to be just a mom or just a postal worker or just to be...well, not an ordinary person...I have a lot of things inside me, a lot of feelings, and a lot of insights, or a few anyway, maybe not a lot compared to some. But what I have is really important to get out and to express and to share, and I wasn't doing that very well as a postal worker...and being a mom is wonderful, but it is limited, and so now with my poetry, I'm beginning...the success, yea, I'm starting to feel good about myself, that more of me, real me, is coming out and doing what it was meant to do....I do want to continue with it, and I do want to continue expressing myself and letting that real person inside of me out....And I just have hopes....It's just a bunch of hopes and dreams.

The women in this study characterized by *check on things* decribed BSE as part of their day-to-day lives, along with health practices such as weight control, exercise, minimal use of alcohol, and not smoking. While some of these health practices also characterized women who did not do BSE, the doers of BSE described BSE as being the most important of these health activities:

> It's part of my health regime. Because, O.K., it's been three months since I last did it, I think it's about time to do it and check on things and make sure that along with all the work I'm doing to make myself healthier I'm not forgetting a part that could jeopardize all of that.

The informants talked about the women who *check on things* as having a *take care* attitude toward health concerns and being *problem conscious*. A *take care* individual was responsible for herself, not in an obligatory manner, but in a way that conveyed that she was doing these things because she liked herself:

> I mention my last marriage because I was in a very abusive relationships. My own self-image was next to nothing. If he hit me, I must have done something wrong....I didn't take very good care of myself. But as I got better....I started being more concerned with who I am and what do I want — what do I expect of me, and that includes my body, my health, and things I would have to do to take care....When you don't care about yourself, it doesn't matter if something is wrong. You don't become aware of it. Everything is wrong. But if you are healthy as far as your own self-image goes, I think you become much more aware and much more concerned.

This passage suggests the importance of a good self-image, but in the card sorts, the informants further refined this idea to *a good body image*. This idea will be discussed in more detail under the analysis of the second domain.

Take care women were known to *seek information* about BSE and to *have time* for it. They deliberately looked for information, either by asking individuals who knew about it or by reading health literature.

> [Following surgery for another health problem] they just mentioned that, you know, you should be doing breast examination. They didn't show me — they didn't tell me anything other than that just — "ask your family doctor" because when I came home I was going to him every day for awhile, so this was one of the subjects that I could bring up quite easily to him and said, "What do they mean? What were they talking about?"
>
> Well, like my neighbor. She orders...what do they call those magazines...something about health today or something. And I know she reads it thoroughly....If she would pick up an article like that [on BSE], she would do it.

Having time encompassed both those whose families were now grown, leaving them time for themselves, as well as those who *made* time in the midst of a busy schedule still full of the demands of a growing family and/or career. The idea of *having time* seemed related to priorities:

> My kids have left home, the nest is empty, and now there is time for me. There is time for me to think I can have a leisurely bath and do breast examination when I'm dressing in the morning....I don't have to have somebody always calling for my attention.
>
> And that sees to — well, you're already in the bath, having a nice bath, you really have the time.

The *problem conscious* women talked about this orientation as being very different from that of the *hypochondriac* outlined above. These women were aware of potential threats to their health and took an active part in minimizing their influence, but they were not obsessed by these concerns. They were thought to *anticipate* and *attend* to health problems.

> I feel that I want to run my life, and I know there's all sorts of carcinogenic-type things in our environment, so since you can't avoid them, the least you can do is minimize the dangers, so I exercise, and I take vitamins, and I pay

> attention to the signals my body gives me and I poke myself a little bit if it seems reasonable, you know, to sort of check up on things, and breast is in the category of poking myself a little bit.

Do Not Do BSE

The second domain, *Do Not Do BSE*, was characterized by two segregates, *know how* and *don't know how*. It was generally agreed that those in the *know how* group knew all the things that those who did BSE knew.

> Breast self-examination is important. I understand the importance of it. I've been educated as to how to do it and the reasons for it, but I don't practice it...and I'm not sure whether that is a denial or a belief that I just, you know, an illogical belief that I'll never get cancer, or a...yea, I'm not sure what its about.

Upon examination of the data, three subsegregates were identified that differentiated those who were knowledgeable but did not do BSE from those who were knowledgeable and did BSE. These were *cancer phobia*, *worried but...* and *not worth it*.

The first subsegregate was *cancer phobia*. The individuals in this group were characterized by an intense fear of cancer. The women who did BSE talked about "the cancer scare" which motivated them to do BSE. The women who did not do BSE talked about the *fear* of cancer, which prevented them from doing BSE. This latter group acknowledged the irrationality of their comments, but they held to them anyway. Generally, they were convinced that if they thought about or listened to things regarding breast cancer, they would be more likely to get it — almost as if they could bring it upon themselves — and so they *tuned them outt*:

> Its sort of like when you watch the news and all you see is death and destruction. Pretty soon you either tune it out or shut it off. Because you just can't take it day and day out. And it's sort of that way with cancer. The more they tell you you're going to get it, the more you start to think that you're going to get it, and so you just tune it right out.
>
> [Cancer is] a fear word. I don't know how to explain it. It's sort of — the minute you bring it up it's sort of a subject you don't really get too involved in because it's something that could happen to you and you just want to keep away from it so it doesn't...and it's only because there is possibly no cure for this — a death sentence.

> away from it so it doesn't...and it's only because there is possibly no cure for this — a death sentence.

They were also convinced that if they checked their breasts for lumps on a regular basis they would be sure to find a lump eventually:

> So when you're having breast examination or doing it, you are looking for cancer, and I don't like that. I think maybe that's why I say it takes too much time — that it's really I don't really like looking for it. If it takes all this time on this on breast then if I find something....If I could just do it quickly and get it out of my mind again, it might be O.K. I don't want to do it because I might find something for sure.

In addition, they doubted that breast cancer could be detected in time for acceptable treatment. Some of the informants went so far as to say that although they knew some women survived breast cancer, they thought that if they got it, they would be sure to die and or have to undergo horrible treatments:

> I know that you tend to exaggerate things, but it's — I think a great fear has been instilled in women that once you find a lump, that's it.
>
> [I thought] "Oh my God, I'm going to die." Then the whole thing went through my mind, like all the kind of weird treatments I'd have to go through, and I'd have to go to the cancer hospital and just all this horrible stuff, and I don't think I could deal with it very well at all.

The second subsegregate was *worried but*.... The women in this group knew about BSE, but did not do it for one of two reasons: either they had *other priorities* or they thought they had *ugly bodies*. *Other priorities* included other health problems, a stressful life, and *just being too busy*. The *other priority* category was seen in slightly narrower terms and in the reverse within the *Do BSE* domain as *have time*.

> Someone who doesn't do it (BSE)? Someone who is really busy, that really doesn't have time to think of it, like take a mother with three or four kids running around, you know, little kids — and she has to work and she has the house to take care of. She would never think of — that would be the last thing on her mind.

In the initial analysis of the data, it seemed that low self-esteem was part of the *worried but...* subsegregate. In the validation interviews, however, women narrowed the concern to poor body image.

> Some are more inclined to look at their bodies and think they're either sexy or they think they're ugly. And so, therefore, if they think their breasts are ugly or their body is ugly, they're not going to do self-examination.

Development of the initial model of factors associated with the practise of BSE

The next stage was to examine the sequencing of the data and to develop an explanatory flow chart of factors that applied or did not apply to informants. If the factors did not apply (i.e., the informants responded negatively), then the women did not practise BSE. If all the factors could be answered affirmatively, then the women did practise BSE.

As can be seen in Figure 4, the first characteristic associated with doing and not doing BSE is related to the social context within which women live. These data suggest that women who do BSE live in a social context that allows them to learn to talk about their breasts, at least comfortably enough to ask their physician and/or close friends about things like how to do BSE. In addition, they acquire a *take care* meaning for the kind of touch that is required in order to do BSE. It is unlikely that women who do not live within a social context that can provide them with these opportunities practise BSE.

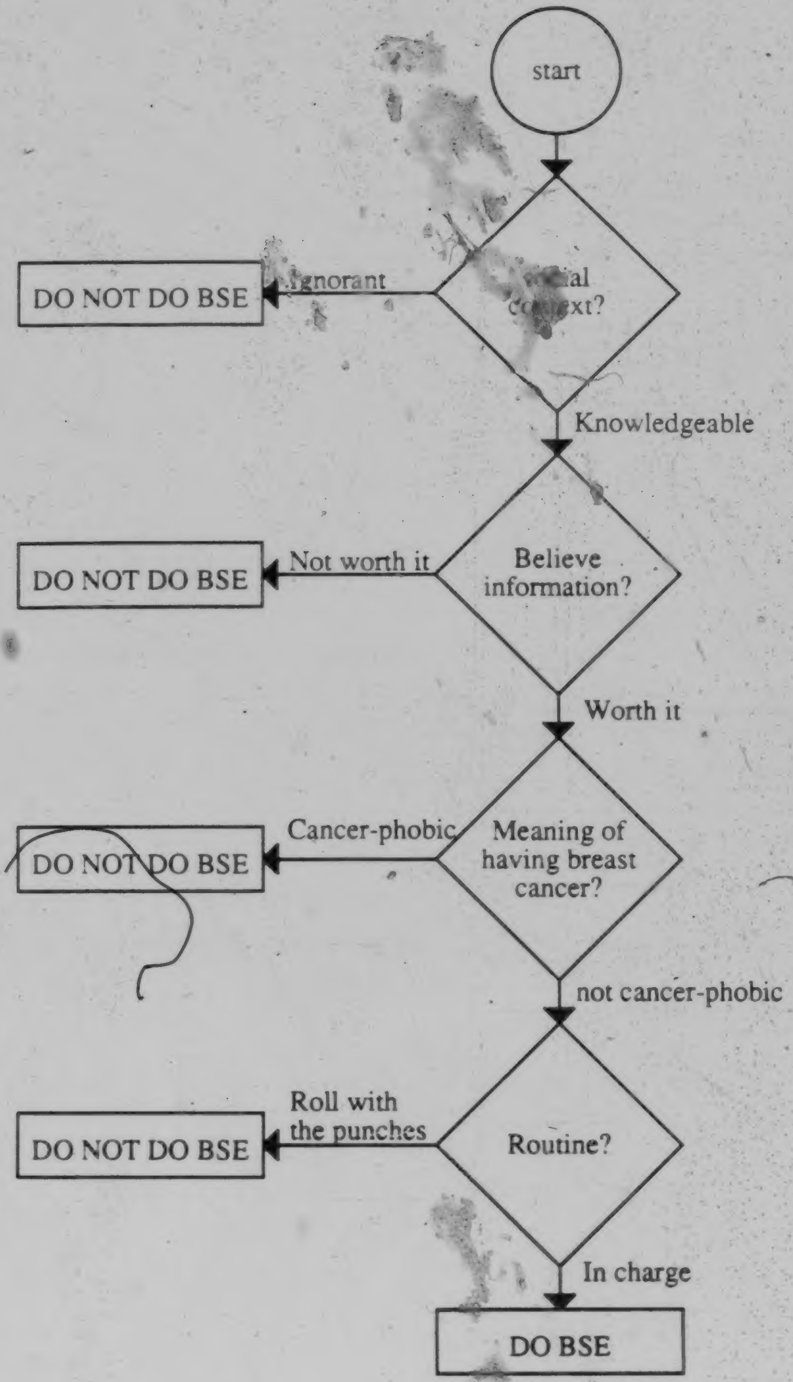
start
DO NOT DO BSE
Ignorant
Social context?
Knowledgeable
DO NOT DO BSE
Not worth it
Believe information?
Worth it
DO NOT DO BSE
Cancer-phobic
Meaning of having breast cancer?
not cancer-phobic
DO NOT DO BSE
Roll with the punches
Routine?
In charge
DO BSE

Figure 4: Initial model of factors associated with doing and not doing BSE.

The second characteristic associated with doing and not doing BSE is related to information. Women who do BSE must know certain things about how to do it. Some will know more about BSE than others, but all of them will have some critical pieces of information. In addition to having the information, however, the women who do BSE believe the information is true. For example, they believe that if they do BSE regularly they are more likely to find a lump while the cancer can still be cured or at least treated in a less aggressive manner. It is highly unlikely that women who do not know and believe the critical information about BSE will do it.

The third characteristic associated with doing and not doing BSE is related to the meaning that having breast cancer would have in one's life, both in terms of treatment and potential death. Women who do BSE have done more than acknowledge their own vulnerability to breast cancer; they have thought about what it would mean to them, their families, and their friends. No one would welcome having breast cancer, but some would cope in a much more adaptive manner. For these women, life would continue, even in the face of death and disfiguring treatment, in a way that would ensure their essence as a woman was not lost. It is unlikely that women who have not come to terms with the meaning that having breast cancer would have for them would do BSE.

The fourth characteristic involves resolving the conflict between society's expectations for women and one's own personal expectations. Women who did not do BSE frequently said that by the time they had finished their work and looked after their husbands/children/ extended families/pets they had no time for themselves and were asleep "before their heads touched the pillow." Women who did BSE, on the other hand, talked about it as being part of what they did to look after themselves. BSE was part of a "routine." It is unlikely that women who have not made BSE part of their "routine" would do BSE.

It should be noted that hypochondriacs also do BSE, but their practise indicates a maladaptive response to the potential threat of breast cancer. This group of women has many of the same characteristics as other women who do BSE, but they do BSE out of an exaggerated sense of harm or personal risk rather than from a sense of taking care of themselves.

This model has been drawn as a series of logically-ordered decision points representing characteristics of women who do and do not do BSE. No detailed quantitative testing of this ordering was performed; rather it was determined based on the interview data. The model accounts for the fact that while most women know about BSE few do it, and shows that while each of the factors plays an important role in understanding who does and does not do BSE, they are not sufficient alone.

CHAPTER IV: THE DEVELOPMENT OF AN INSTRUMENT TO MEAUSRE FACTORS ASSOCIATED WITH DOING AND NOT DOING BREAST SELF-EXAMINATION

The main tasks in the second phase of the study were to operationalize the key elements of the model and pretest the questionnaire that would be used in the final phase of the study. Since none of the existing instruments seemed to capture the ideas uncovered in the interviews, a set of 11 subscales were developed by the investigator. A questionnaire containing the 11 subscales, the Crowne-Marlowe Social Desirability Index (CMSDI), demographic items, and a BSE practice item was then distributed to a convenience sample of 24 women on two occasions two weeks apart.

Compiling the items for the questionnaire

Eleven categories of characteristics associated with doing and not doing BSE were identified in the first phase of the study. These categories are identified in Figures 2 and 3 by numerals in the upper left hand corner of their respective boxes in the taxonomies. In some cases, these categories were segregates, while in other cases they were subsets of the domain. Thus, a set of 11 subscales of eight items each were initially developed. The subscales were worded in such a manner that approximately half the items were scored positively and half were scored negatively, balancing for response set.

Content validation

The subscales along with a group of demographic and BSE practice questions were submitted to a group of seven experts in BSE, breast cancer, and health behavior for content validation. Validators were given a description of what the subscale was suppose to measure and were asked to rate each item as follows: 1—totally irrelevant, 2—difficult to tell, needs major revision, 3—good item, needs minor revision, or 4—fine as it stands (as suggested by Lynn, 1986). They were also asked to make suggestions for changes and the subscales were revised based on their comments.

Response bias

A related task in this phase of the study was to determine the extent to which individuals' answers to the items comprising the questionnaire might be subject to social desirability response bias. The potential for social desirability response bias was of particular concern in this study since the informants readily discussed the tendency of women to tell their physician that they did BSE when in fact they did not.

The availability of instruments to measure social desirability response bias is limited. Of those that are available, little is known about their reliability or validity. An additional difficulty is that most of them are based to some extent on other personality inventories designed to detect pathological problems. One tool, the Crowne-Marlowe Social Desirability Index (Crowne & Marlowe, 1964), does not have the same pathological undertones. In addition, despite the fact that it was developed 25 years ago, Ballard, Crino, and Rubenfeld (1988) have shown that many of the items still discriminate well between those who tend to give a socially desirable response and those who do not. Thus, all 33 items comprising the scale were included in the pilot-tested form of the questionnaire. Item discrimination indices were compared to those presented by Ballard et al. (1988), and those items with an index of discrimination (D) below 0.25 (D = proportion in upper 25% who gave socially desirable answer minus proportion in lower 25% who gave socially desirable answer) were dropped from further analysis as they suggested.

Following revision of the subscales based on comments from the content validators, the subscales along with the 33 items from the Crown Marlowe Social Desirability Index (CMSDI) were combined into a questionnaire such that the 11 subscales, numbered consecutively, comprised the first 88 items, the CMSDI comprised items 89-121, the demographic questions comprised items 122-129, and the BSE practice questions comprised items 130-131. At the end of the questionnaire, individuals were asked to give permission for their comments to be kept for future studies and to state how long it took them to complete the questionnaire (see Appendix IV).

Sampling considerations

Source of sample

As outlined in Chapter Two, there has been some debate in the BSE practice literature about the influence of age and socio-economic status (SES) on BSE practice. While this investigator did not believe that these demographic variables influenced BSE practice, an effort was made to ensure that the sample in this study included women from both high and low SES groups as well as a wide range of ages, making it possible to test this hypothesis. Given that Blishen, Carroll, and Moore (1987) had recently revised their SES index and that this interval scale instrument was based on Canadian census data the Blishen Index (BI) formed the basis upon which SES distinctions were made. The indicators of SES in the Blishen Index (BI) were income level, based on pooled median employment income from all paid labor, taking into account the proportions of men and women in the occupation, and educational level, based on the proportion of incumbents with a university or post-secondary degree minus the proportion without a high school diploma (thus sometimes yielding a negative number). The index has a mean of 42.74, a standard deviation of 13.28, a minimum of 17.81, and a maximum of 101.74. For the purposes of this study, an individual was placed in the high SES if they were single and had an SES score greater than 42.74 or if they or their marriage/common-law partner had an SES score greater than 42.74. All others were placed in the low SES group.

Blishen et al. (1987) offer several cautionary notes. First, they claim their index is "not a measure of occupational prestige but a composite of the prevailing income and education levels in each occupation" (p. 411) and that this may pose difficulties if one wished to analyze the differential effects of each variable. Further, it is preferable to disaggregate SES whenever it is suspected that the differential effect of income and education may be important. For that reason, they provided the values for education and income used in their SES calculations. They also note that although the incomes of men and women within some particular occupational group were highly disparate, all individuals within any given occupational category were defined by the BI as being equal in SES.

Next, while the values assigned by the BI give the precise position of a particular occupation within the occupational structure, SES scores are by nature abstracted from class relations. They note that "a socioeconomic index may be a poor substitute for the analysis of class relations, but [were] a serviceable indicator of the inequities that are abound up in the technical division of labour" (p. 472). Last, the BI and other indices like it are insensitive to the historical processes through which the differences in SES come about.

With these ideas in mind, the analysis of the influence of SES in this study included the SES score form the BI as well as the separate income and education scores provided by Blishen et al. (1987). The difference between the income of men and women within a particular occupational category was irrelevant in this study since all the subjects were women.

Two groups of women were then asked to complete the questionnaire. In choosing a group of women to represent the low SES end of the BI, the primary concerns were that the women were of varied ages and able to read and write English well enough to complete the questionnaire. Sales clerks had a BI SES score of 30.93 and were therefore considered representative of the low SES group. It should be noted that given the definitions of high and low SES outlined above it was expected that not all of the women from this group who returned the questionnaire would actually be in the low SES group. Rather, sales clerks were chosen as a group in which one would likely find a relatively high concentration of low SES individuals, thus facilitating data collection for that part of the sample.

In choosing a group of women to represent the high SES end of the BI, the main concern was finding a group of women that was relatively easy to access and provided enough women of varied ages to permit the type of analysis required in this study. Because women in high SES jobs tend not to be concentrated in large numbers in any one occupational place, this sample was obtained through a local breast clinic. The breast clinic was chosen because the investigator anticipated being able to obtain permission to access participants, considering that she worked there in a clinical capacity one half day per week, because the patients spanned the full age range of interest, and because a large proportion of the patients were self-referred and therefore were likely to be from the high SES group. It was expected, as outlined for the other part of the sample, that not all of the breast clinic patients would actually be from the high SES group. Rather, it was chosen as a place one would be likely to find a higher concentration of individuals in the high SES group.

Sample size

The questionnaire was administered to 66 women. Of these, 25 were sales clerks at a local discount department store, 20 were patients of the breast clinic, and 21 were graduate students in nursing at a local university. Initially, it was expected that the return rate would be about 60% and that the sample provided by the sales clerks and the breast centre patients would be sufficient for the type of analyses to be undertaken during this phase of the study. The graduate students were added to increase the sample size once it became known that only 14 of the initial 45 subjects (31%) were willing to complete the questionnaire a second time, which was required in order to establish the stability of the subscales. All of the graduate students in nursing were in the high SES group. The desired sample size for this phase of the study was 24 subjects. A sample of this magnitude was chosen because it was financially manageable, was expected to yield some subjects who did BSE and some who did not and was expected to provide a 95%

confidence interval for any correlation coefficients of about -0.35 to +0.35 if the correlation in the population was 0. This was expected to be satisfactory since correlations considerably higher than 0.35 were anticipated.

Data collection and analysis

Given the large number of subjects that would be required for the third phase of the study and the desire to pretest the questionnaire on a sample very similar to the one that would be used in the third phase, it was decided to approach one of the local large discount department stores about the possibility of obtaining subjects for the low SES group from among their employees. The store management agreed to allow the investigator to place the questionnaire packages in the employees' lunch room with a sign asking all women to take one. The package included a covering letter signed by the investigator asking the women to read the enclosed information, complete the questionnaire, and return it in the self-addressed stamped envelope . The store management assured the investigator that their staff spanned the full age range of interest to the investigator (20 - 65 years of age). It was decided to conduct the pilot test of the questionnaire at one small branch of the store chain and to undertake the validation phase of the project at two larger local branches.

Permission to hand out the questionnaire package to breast clinic patients as they were leaving the clinic was obtained from the attending physicians. This group received the same information sheet given to the store employees, but the covering letter was signed by the attending physicians.

Permission to give the questionnaire package to graduate nursing students was obtained from the faculty ethics committee. This group received the same covering letter, information sheet, and questionnaire given to the store employees as well as a separate consent form (see Appendix V).

For the purposes of the pilot test with the low SES group, 25 questionnaire packages (one for each employee) were placed in the lunch room at the small branch of the department store. All 25 were taken, and 8 (32%) were returned. Two weeks after each one was returned, a second copy of the questionnaire was mailed to the five individuals who indicated that they were willing to complete it a second time. Of these, all five were returned. Therefore, complete data were available on 20% (5 out of 25) of the department store employees (see appendix VI for pilot questionnaire).

For the pilot test with the high SES group, 20 questionnaire packages were handed out by the receptionist to those breast clinic patients who were willing to take one as they left the clinic. Because BSE practice data is readily available on the patients' charts, the receptionists were able to give approximately half of the packages to women who reported doing BSE at least once every three months and the other half to women who reported doing BSE less often. Of these, 12 (60%) women returned the questionnaire and indicated a willingness to complete it a second time. Two weeks after each questionnaire was returned, a second copy of the questionnaire was mailed to each subject. Of these, 9 were returned. Therefore, complete data sets were available on 45% (9 out of 20) of the breast centre patients.

For the pilot test with the graduate students in nursing, questionnaire packages were placed in the student mailboxes of all 21 female first year masters degree nursing students following a brief classroom presentation about the study. Eleven (52%) of the women returned the questionnaire and indicated a willingness to complete it a second time. Of these, ten returned the second copy of the questionnaire, giving complete data for 48% (10 out of 21) of the sample.

In summary, then, 24 women completed the questionnaire once. These women ranged in age from 19 to 60 years (mean 36.3). Their educational backgrounds were varied (grade 9 to graduate degree). Most of them had at least some university education. Nineteen of the women were married, while six were single, three were divorced, and three were widowed. Approximately half (54.8%) of the women had at least one child. Using the definitions for high and low SES outlined above, five of the women from the discount department store were from the low SES group, and three were from the high SES group. Five of the women from the breast centre were from the low SES group, and seven were from the high SES group. All eleven of the nursing graduate students were from the high SES group. Thus, 10 of the women in the pilot study sample were from the low SES group, and 21 were from the high SES group. Twenty of the women said they did BSE at least once every three months, while three said they did it less often. Four of the women said they did not do BSE at all, and 4 women did not indicate whether they did BSE or not. Of 24 who completed the questionnaire once, 21 agreed to complete it a second time.

The questionnaire was checked for clarity by asking the women to underline any words that were not clear to them. Length of time required for completion was determined by asking the women to keep track of how long it took them to complete the questionnaire and then indicate that in a space provided on the last page. The average length of time required for completion was 15 minutes.

Internal consistency

The internal consistency of each subscale was assessed by calculating Cronbach's alpha following the first and second administration of the questionnaire. Items that contributed minimally to the corrected item-total correlation (0.1 or less) were generally dropped and the reliability of the subscale adjusted for test length using the Spearman-Brown prophecy formula. As can be seen in Table 5, scales 2, 3, 7, and 10 had reliability coefficients of 0.8 or better and therefore were considered very consistent given the sample size (24).

For those subscales consisting of less than eight items, the adjusted reliability coefficients indicated that if additional parallel items were added these subscales could also be brought into the 0.8 range or better.

Table 5

Internal consistency (Cronbach's alpha) of BSE subscales (n=24)

	Scale	Number of items	Cronbach's alpha	Spearman-Brown adjustement for eight items
1	(too scared)	3	0.63	0.82
2	(fatalistic)	8	0.81	
3	(other priorities)	8	0.88	
4	(ugly body)	3	0.62	0.81
5	(won't get it)	4	0.73	0.85
6	(roll with the punches)	3	0.61	0.81
7	(want to learn)	8	0.89	
8	(won't learn)	4	0.77	0.87
9	(not told)	5	0.77	0.84
10	(don't go to doctor)	8	0.81	
11	(hopeful)	5	0.74	0.82

Stability

The stability of the subscales was assessed by calculating the correlation between each pair of scale scores (time 1 scale 1 with time 2 scale 1, time 1 scale 2 with time 2 scale 2, and so on) following two administrations of the scales two weeks apart using a t-test for correlated samples. Given the sample size (21), the subscales appeared to be quite stable (see Table 6). Since the 11 subscale scores are dependent, the value of p required for significance is 0.0045 (.05/11), based on the Bonferonni procedure. Thus none of the differences are significant.

Table 6

Test-retest reliability and value of p for t-test on the means of BSE subscale and Crowne-Marlowe Social Desirability Index Scores (n=21)

Scale	Number of items	Test-retest reliability	Value of p for t-test on means
1	3	0.62	0.01
2	8	0.53	1.0
3	8	0.87	0.24
4	3	0.80	0.10
5	4	0.73	0.24
6	3	0.28	0.09
7	8	0.78	0.32
8	4	0.76	0.95
9	5	0.94	0.35
10	8	0.76	0.25
11	5	0.40	0.13
Crowne-Marlowe	33	0.78	0.38

Initially, the plans were to check for potential for social desirability response bias by dropping all items in the CMSDI that failed to show indices of discrimination greater than 0.25 in the pilot study, recalculating all subjects' CMSDI scores, and calculating the correlation between the scores on each of the eleven scales and the recalculated CMSDI score following both administrations of the questionnaire. Given the size of the sample in this phase of the study, a correlation between -0.35 and +0.35 would indicate that no social desirability response bias was present. If social desirability response bias was present, a negative correlation was expected (subjects would reply that they did BSE, and therefore have low BSE subscale scores and would have a propensity toward giving the socially desirable answer, thus scoring high on the CMSDI). When attempts were made to compare the CMSDI scores of those who scored in the top 25% with those who scored in the bottom 25%, it was apparent that the indices of discrimination were heavily influenced by the small sample size. Thus, it was decided to leave the CMSDI in the final version of the questionnaire and re-examine the issue of discrimination with a larger sample size. Out of interest, the correlation between the CMSDI score and each of the subscales was calculated for both administrations of the questionnaire. As can be seen in Table 7, there appears to be some social desirability response bias operating at the time of the second administration of the questionnaire for subscales 3, 5, 7, and 9.

Table 7

Correlation between BSE subscale scores and Crowne-Marlowe Social Desirability scores at first (n=24) and second (n=21) administrations of the questionnaire

Subscale	first administration	second administration
1	-0.09	-0.32
2	-0.16	0.06
3	-0.26	-0.45
4	0.10	-0.04
5	-0.16	-0.35
6	0.09	0.16
7	-0.04	-0.60
8	-0.14	-0.33
9	<.01	-0.42
10	0.16	-0.01
11	0.25	0.23

The larger correlations between the subscale scores and CMSDI scores may have occured because the first administration of the test sensitized participants to the socially desirable answer in some way.

Revisions to BSE Subscales

Given the results of the pretest, the questionnaire was modified such that

5 items were dropped, and 4 new items were added to scale 1;
5 items were dropped, and 3 new items were added to scale 4;
4 items were dropped, and 2 new items were added to scale 5;
5 items were dropped, and 3 new items were added to scale 6;
4 items were dropped, and 2 new items were added to scale 8;
3 items were dropped, and 2 new items were added to scale 9; and
3 items were dropped and 1 new item was added to scale 11.

The wording of the items that were added was based on the concepts common to remaining items and the interview data (see Appendix XI for revised version of questionnaire). The revised version of the questionnaire was therefore 76 items in length. The decision to drop items was based on a low corrected item-total correlation (generally less than 0.1).

CHAPTER V: VALIDATION OF THE MODEL

The main task in the third phase of this study was to test the validity of the BSE Frequency Model. Since items were added to the BSE subscales following the pretest, additional testing of the reliability and validity of the BSE subscales was also conducted. These tasks were accomplished by using a descriptive design in which a questionnaire containing the revised subscales, the Crowne-Marlowe Social Desirability Index (CMSDI), demographic items, and a BSE practice question was administered to a group of 341 women.

Sampling considerations

The population of interest in this study was English speaking Canadian women between the ages of 18 and 65 years. Since a sample heterogeneous with respect to SES and age was desired and randomization was not feasible, the questionnaire was administered to a convenience sample of 341 women (107 additional patients from the local breast clinic used in the instrument development phase, 154 sales clerks at local discount department stores, and 80 undergraduate nursing students). Of these, 52% (176) were returned (82 from breast clinic patients, 46 from discount department store employees, and 48 from undergraduate nursing students).

Complete demographic information was available for 158 women. The sample ranged from 18 to 74 years of age (mean 42.2 years). Education ranged from grade 8 or less to a graduate degree. The majority of the informants were married (62%), protestant (54.4%), and from slightly above-average SES households (50.88 on Blishen Index [Blishen et al., 1987]). Seventy-two percent (114) of the women did BSE at least once every three months, and 37% (59) did BSE monthly.

The desired sample size in this study was estimated to be 196 participants. This number met the minimum number required for factor analysis (two subjects per variable) and was considered to be manageable given available resources. Based on the procedures for calculating power given by Cohen (1977), the power of the F test for multiple regression with 13 predictors (estimated lower bound of $R = 0.20$, and $\alpha = 0.05$) was calculated to be greater than 0.97 for a sample size of 173. Following internal consistency calculations, however, 17 items were dropped, leaving only 71 subscale items. Given conflicting findings in previous studies regarding the role of age and education, age and education were added to the 71 subscale variables for further analysis, giving a total of 73 items. Complete data for 158 subjects were available for the factor analysis, meeting the minimum number requirement of 2 subjects per variable.

Data collection

As patients came for their appointment at the breast clinic, they were given a letter from the attending physicians explaining the study and asking those interested in learning more about it to sign and return an attached information form. While waiting to see their physician, those who had completed the information form were invited to meet with the investigator or the research assistant privately to discuss the study. Those willing to participate were given a package containing two copies of the consent form, an information sheet (Appendix XII), the questionnaire, and a self-addressed stamped envelope. The return rate for the breast clinic patients was 77% (82/170).

Questionnaire packages containing the same materials used at the breast clinic as well as a covering letter were initially administered to department store employees through the personnel manager who distribute them with pay cheques. When this approach failed to produce sufficient returns, permission was obtained to place a box containing the packages in the lunch room along with an open letter explaining the study and requesting participation, but still, the return rate remained low. Permission was then obtained for the investigator or research assistant to approach women in the lunch room at a second store, explain the study, and distribute the packages to those willing to participate. Following this approach, questionnaire returns doubled, but still, they remained low. In a final attempt to increase returns, prospective participants at a third store were offered $5.00 in exchange for their returned questionnaire (see Appendix XIII for revised consent). The return rate at the third store was slightly higher than at either of the other two stores. The return rates for the deparment store employees were store 1—25%(15/58), store 2—29%(16/56), store 3—38%(15/40). The overall return rate was 30% (46/154).

Following receipt of permission to access the undergraduate nursing students, the study was explained to a large class of senior students, and the questionnaires were distributed. The return rate for the students was 60% (48/80).

Data analysis

Reliability of the BSE Subscales

Given that some items were added following instrument development, the internal consistency was calculated again. Complete data were available for 159 individuals. The means and standard deviations of the subscales appear in Table 8.

Table 8

Means and standard deviations of BSE subscales (n=159)

Subscale	Mean**	Standard deviation
1(scared)	3.41	1.20
2(fatalistic)*	2.38	0.91
3(other priorities)*	3.03	1.29
4(ugly body)	3.70	1.01
5(won't get it)	2.06	1.06
6(roll with the punches)*	3.15	0.96
7(want to learn)*	2.32	0.95
8(embarrased)	2.08	1.08
9(told)	2.21	1.18
10(go to the doctor)*	2.50	1.09
11(hope)*	2.04	0.92

*based on n=173 (all others based on n=176)
**based on a scale from 1 to 7

Items that contributed minimally to the corrected item-total correlation (0.1 or less) were generally dropped,and the reliability of the scale was adjusted for test length using the Spearman-Brown prophecy formula. All but subscale 6 had reliability coefficients greater than 0.69 (Table 9), indicating that they were reasonably consistent. For those subscales consisting of less than eight items, the adjusted reliability coefficients indicated that if additional parallel items were added, they could be brought considerably closer to a reliability coefficient of 0.8 or better.

Table 9

Internal consistency (Cronbach's alpha) of revised BSE subscales (n=159)

Scale	Number of items	Cronbach's alpha	Spearman-Brown adjustment for eight items
1(too scared)	6	0.72	0.78
2(fatalistic)	7	0.70	0.73
3(other priorities)	8	0.85	
4(ugly body)	5	0.69	0.78
5(wont get it)	5	0.73	0.81
6(roll with the punches	5	0.47	0.59
7(want to learn)	8	0.83	
8(embarassed)	6	0.76	0.81
9(not told)	7	0.82	
10(don't go to doctor	8	0.79	
11(hopeful)	6	0.78	0.83

As can be seen in Table 10, there were modest correlations between some of the subscales.

Table 10

Correlations between BSE subscales

Subscale	1	2	3	4	5	6	7	8	9	10	11
1(scared)	1.00										
2(fatal)	0.36	1.00									
3(other prio.)	0.15	0.49	1.00								
4(ugly body)	0.30	0.34	0.26	1.00							
5(won't get it)	0.16	0.48	0.73	0.20	1.00						
6(roll with the punches)	-0.13	0.50	0.19	0.07	0.26	1.00					
7(want to learn)	0.20	0.39	0.42	0.26	0.44	0.08	1.00				
8(embarrassed)	0.33	0/46	0.34	0.37	0.43	0.05	0.40	1.00			
9(told)	0.17	0.37	0.45	0.20	0.46	-0.00	0.46	0.37	1.00		
10(go to dr.)	0.11	0.42	0.42	0.20	0.45	0.24	0.29	0.27	0.35	1.00	
11(hope)	0.07	0.27	0.19	0.39	0.25	0.08	0.27	0.32	0.10	0.34	1.00

Validity of the BSE Subscales

In order to test for potential social desirability response bias, the index of discrimination (D) was calculated for all items in the CMSDI by subtracting the proportion of participants who scored in the bottom 25% on the CMSDI and who also gave the socially desirable response to each item from the proportion who scored in the top 25% on the CMSDI and who also gave the socially desirable response. As can be seen in Table 11, eight items had values of D less than 0.25 and were subsequently dropped from further analysis. Complete data were available for 93 individuals.

Table 11

Indices of Discrimination for Crowne-Marlowe Social Desirability Response Index (CMSDI)

(n=93)

CMSDI item number	Value of D
1	.51
2	.43
3	.43
4	.58
5	.31
6	.43
7	.48
8	.40
9	.24*
10	.31
11	.23*
12	-.10*
13	.47
14	.40
15	.50
16	.60
17	.14*
18	.34
19	.43
20	.16*
21	.53
22	.14*
23	.31
24	-.05*
25	.41
26	.51
27	.45
28	.33
29	.20*
30	.29
31	.31
32	.35
33	.42

* items with values of $D < 0.25$

Correlations were then calculated between the revised CMSDI scores and subscale scores. Since the subscales were keyed in such a manner that those who did BSE would receive low scores, social desirability response bias would appear as a negative correlation (low score on BSE subscale, high score on CMSDI). Since the 11 subscale scores are dependent, the value of p required for significance is 0.0045 (.05/11), based on the Bonferonni procedure. As can be seen in Table 12, Subscales 3, 4, 7, and 11 are significantly correlated with the CMSDI.

Table 12

Correlation between Crowne-Marlowe Social Desirability Index (CMSDI) and BSE subscales

(n=158)

Subscale	r	p
1(too scared)	-0.09	0.1200
2(fatalistic)	-0.15	0.0230
3(other priorities)	-0.30	<0.0045
4(ugly body)	-0.21	<0.0045
5(won't get it)	-0.19	0.0060
6(roll with the punches)	0.20	0.1020
7(want to learn)	-0.23	<0.0045
8(embarassed)	-0.16	0.0170
9(not told)	-0.15	0.0250
10(don't go to doctor)	-0.16	0.0200
11(hopeful)	-0.28	<0.0045

The null hypothesis in this case is that the correlation in the population is 0. Although the correlations for items 3, 4, 7, and 11 are significant in the hypothesis testing sense, calculation of the 95% confidence boundaries, within which the true correlation can be expected to be found, suggests that the correlations are relatively small. For example, the 95% confidence interval for the correlation coefficient for Subscale 3 (other priorities) would be approximately -0.07 to -0.40 for 158 participants. Thus, the influence of social desirability response bias on BSE subscale scores was minimal.

Factor analysis was undertaken to further refine the items designed to identify the characteristics of individuals who were doing and not doing BSE. Although categories identified using an ethnoscientific approach are assumed to be orthogonal, efforts were made to verify this by performing both orthogonal (Varimax) and oblique (Promax) rotations. Since the orthogonal solution was more easily interpreted, it was retained. As only the common variance among individual items was of interest, a principal axis solution was sought. The squared multiple correlations among the items ranged from 0.448 to 0.877. Eleven factors were requested. After twenty nine iterations, the communalities stabilized, and 20 eigenvalues above 1 (13.99, 4.16, 3.72, 3.63, 2.82, 2.39, 2.36, 2.17, 2.00, 1.87, 1.73, 1.68, 1.58, 1.50, 1.37, 1.27, 1.25, 1.17, 1.15, 1.05) were obtained.

The principle criteria for the establishment of the number of factors was simple structure (Thurstone, 1947), at least 2 items with factor loadings of 0.3 or greater (Crocker & Algina, 1986), and conceptual meaning. Based on this critieria, 8 latent variables (factors) were identified (Table 13 and Appendix X). Thirty-five items either had very small communalities or had low loadings on more than one factor.

Table 13

Factor number, content, factor loadings, and subscale location for 8 factors obtained from factor analysis (Varimax rotation) of BSE subscale scores and selected demographic variables (n=158)

Factor number	Item	Factor loading	Subscale location
1	I'm too busy to do BSE	0.76	3-1
1	I forget to do BSE	0.77	3-2
1	I check breast even if sick	0.81	3-2
1	BSE not important to me	0.48	3-4
1	I do BSE even when busy	0.82	3-7
1	I have no time for self	0.42	3-8
1	I would do BSE even if no one in family had breast cancer	0.73	5-3
1	I would do BSE if no one I knew had breast cancer.	0.65	5-4
2	BSE information hard to understand for me	0.83	7-1
2	BSE information easy to follow	0.79	7-2
2	BSE information confusing for me	0.84	7-3
2	BSE information straightforward for me	0.70	7-4
3	BSE good way to find lumps	0.58	2-4
3	I have less chance of dying of breast csancer if I do BSE	0.70	2-8
3	Those who value health should do BS	0.77	3-5
3	Woman who doesn't check has priorities mixed up	0.52	3-6
3	I know where to get BSE information	0.52	7-7
4	I'm afraid I will find a lump	0.67	1-1
4	I will get breast cancer	0.59	1-2
4	I'm afraid to think about breast cancer	0.69	1-3
4	I'm afraid to hear about breast cancer	0.78	1-4

Table 13 (continued)

Factor number	Item	Factor loading	Subscale location
5	Should only go to doctor when really sick	0.58	10-1
5	I go to doctor regularly	0.68	10-2
5	I go to doctor when feel awful	0.78	10-3
5	Going to doctor when not sick wastes money	0.66	10-4
5	To much trouble to go to doctor. unless I really need	0.66	10-5
6	I have little to look forward to	0.76	11-2
6	Most have happier future than me	0.77	11-3
6	I have lots to accomplish	0.47	11-4
6	Cheerful people annoy me	0.63	11-5
6	Those who look on the bright side annoy me	0.59	11-6
7	Doctor asks if I do BSE	0.82	9-1
7	My doctor stresses BSE	0.82	9-3
7	Women not told about BSE	0.52	9-6
7	Doctors. don't discuss BSE with patients	0.60	9-7
8	BSE touch against my upbringing	0.83	8-1
8	I'm embarassed touching to do BSE	0.57	8-3
8	BSE touching O.K. according to upbringing	0.75	8-6

All but items 5 and 6 from Subscale 3 (other priorities) had loadings above 0.4 on Factor 1. Items 3 and 4 from Subscale 5 (won't get it) had loadings above 0.6 on this factor. No items from Subscale 5 loaded on other factors. This factor was named *taking time*. *Taking time* includes the decision to do BSE in the midst of a hectic schedule.

The second factor is comprised of items 1-4 from Subscale 7 (want to learn). This factor was named *understanding*. *Understanding* means being able to make sense of information about BSE.

The third factor was comprised of item 4 and 8 from Subscale 2 (fatalistic), items 5 and 6 from Subscale 3 (other priorities), and item 7 from Subscale 7 (want to learn). This factor was named *valuing BSE*. *Valuing BSE* includes the perception that BSE is an effective method of finding breast cancer early and that all women "should" do BSE.

The loading of items from Subscale 3 (other priorities) on both factors 1 and 3 suggests that the establishment of priorities involves both the decision to rearrange one's life in order to set aside required time and the belief that the object of one's organizational endeavours is "worth it".

The fourth factor was comprised of items 1-4, and 7 from Subscale 1 (scared). This factor was named *terrifying*. All of the items that loaded on this factor are characteristics of a woman who is terrified of breast cancer. This terror is understandable in the context of the interviews, during which some women talked about having breast cancer as being synonymous with mutilating surgery and/or untimely death. The woman who is terrified is very sure that she will get breast cancer at some point in her life. Thus, she decides to not even think or hear about breast cancer **until** she actually gets it. Because she must check her breast regularly, which in her mind is tantamount to looking for cancer, in order to derive the potentially benficial effects of early detection, she decides to not do BSE.

The fifth factor included items 1-5 from Subscale 10. This factor was named *monitoring*. *Monitoring* includes observing one's body and seeking help from the health care system as necessary.

The sixth factor included items 2 through 6 from Subscale 11 (hope). This factor was named *positive outlook*. This *positive outlook* includes a sense of hopefulness about the future.

The seventh factor included items 1, 3, 6, and 7 from Subscale 9 (told). This factor was named *advisement*. Given the present design of the health care system, this advisement is generally obtained by "going to the doctor." In addition to giving advice, advisement includes "selling" the importance of following the advice. Advice may or may not be solicited.

The eighth factor is comprised of items 1, 3, and 6 from Subscale 8 (embarassed). This factor was named *off limits*. These items suggest that some behaviours are either avoided or "not allowed" by one's cultural rules.

The remaining factors were uninterpretable. No items from Subscales 4 or 6 loaded on any factors. It is not surprising that Subscale 6 failed to load, given its low internal consistency. Several items from Subscale 4 had low loadings on more than one factor, and thus they were not very helpful for factor interpretation.

As a final check on the validity of the instrument, subscale scores for those who do BSE (*doers*) and do not do BSE (*nondoers*) were formed by summing the values of the scales belonging to each group of items. These scores were compared using MANOVA (n=168), followed by univariate F tests of individual subscales. The MANOVA was significant (Pallai test, F=8.95, p<0.01) (see Table 14 for subscale means).

Table 14

Subscale means, Definition 1 and Definition 2 (n=168)

	Definition			
	1		2	
Subscale	Do BSE	Do not do BSE	Do BSE	Do not do BSE
1(scared)	3.90	3.30	3.65	3.17
2(fatalistic)	2.98	2.18	2.58	2.09
3(other priorities)	4.28	2.58	3.67	2.02
4(ugly)	4.17	3.56	3.94	3.37
5(won't get it)	2.91	1.78	2.38	1.60
6(roll with the punches)	3.28	3.12	3.14	3.20
7(want to learn)	2.82	2.15	2.48	2.09
8(embarrased)	2.74	1.86	2.22	1.91
9(told)	2.91	1.95	2.45	1.83
10(go to the dr.)	3.06	2.31	2.68	2.24
11(hope)	2.33	1.94	2.12	1.91

Multivariate analysis of variance was the primary method for comparing all means simultaneously. The univariate F tests which followed compared each variable separately (i.e., did not take correlations among the variables into account). The stepdown F considers all the variables simultaneously, but it removes the effects of the first variable at step 2, the first and second variables at step 3, the first, second,and third variable at step 4, and so on. Thus, given *scared, fatalistic*, and *other priorities*, the remaining variables do not show significance (Table 15). Clinically, it was the investigator's observation that many women who did BSE monthly seemed to do so because of their increased risk of getting breast cancer. Thus, it was not surprising to find that when Definition 2 was used, Subscales 5 (won't get it) and 6 (roll wtith the punches) also contributed to the differentiation of those who do and do not do BSE. The contribution of Subscale 6 (roll with the punches) when Definition 2 was used is difficult to interpret. On one hand, the numerical difference required to establish significance is very small due to the large sample size. Since the internal consistency of this subscale was so low, the contribution of this subscale may simply be an artifact of the data. On the other hand, this difference may be real. It may be that those who do BSE have a more deliberate approach to health behaviour when compared to all other women. The former is more likely the case since none of the items from Subscale 6 loaded above 0.3 on any latent variable.

Table 15

Stepdown F for differences between BSE subscale scores for those who do and do not do BSE (Definitions 1 and 2) (n=168)

Subscale	Stepdown F for Def. 1	Stepdown F for Def. 2
1(too scared)	8.98**	6.67*
2(fatalistic)	22.25**	7.73**
3(other priorities)	53.38**	91.66**
4(ugly body)	1.10	2.80
5(won't get it)	0.46	6.22*
6(roll with the punches)	0.26	3.98*
7(want to learn)	0.09	0.80
8(embarassed)	1.94	2.33
9(told)	0.49	0.03
10(go to the doctor)	0.13	0.03
11(hope)	0.09	0.10

*significant beyond p = 0.05
**significant beyond p = 0.01

As can be seen in Table 16, when the subscales were analyzed individually, and *doers* were defined as those who checked their breasts at least once every three months and *nondoers* were defined as all others (definition 1), the differences between means on all subscales except subscale 6 (roll with the punches) were significant ($p<0.05$). When the *doers* were defined as those who did BSE monthly, and the *nondoers* were defined as all others (definition 2), only the differences for means on subscales 1, 2, 3, 4, 5, 7, 8, and 9 were significant (p<.0.05).

The failure of the difference between the two groups' means to reach significance on subscale 6 was likely related to its lack of internal consistency. The lack of significance for subscales 8, 10, and 11 is more difficult to understand. This may be partly due to the fact that women who did BSE at least once every three months defined themselves as *doers*, despite the fact that they had been taught to do it monthly. They frequently said that the doctor told them to do it every month, but they thought once every two or three months was "good enough " Thus, when definition 2 was used, many women who thought of themselves as *doers* were included among *nondoers* , and their subscale scores were averaged. The influence of the *doers* scores was probably sufficient enough to decrease group differences to a level that was no longer significant.

Table 16

Univariate F for differences between BSE subscale scores for those who do and do not do BSE (Definitions 1 and 2) (n=168)

Subscale	Univariate F for Def. 1	Univariate F for Def.2
1(too scarded)	8.98 **	6.67*
2(fatalistic)	30.84**	12.60**
3(other priorities)	85.75**	107.55**
4(ugly body)	12.71**	13.47**
5(won't get it)	48.23**	24.38**
6(roll with the	0.92	0.16
7(want to learn)	17.76**	7.06**
8(embarassed)	24.45**	3.28
9(told)	25.23**	11.81**
10(go to the doctor)	16.71**	6.53
11(hopeful)	6.11*	2.08

*significant beyond p = 0.05
**significant beyond p = 0.01

Based on these findings, the investigator concluded that the BSE subscales were reasonably valid.

Validity of the BSE Frequency Model

The initial version of the BSE Frequency Model had four components (social context, information, meaning of having breast cancer, and routine). As can be seen in Table 17, the hypothesized definitions of each component, initially conceptualized as a composite of various subscales, was altered following the quantitative analysis.

Table 17

Relationship between BSE Frequency Model, subscales, and latent variables obtained through factor analysis

Initial component	Subscales	Latent variables
Social context	4(ugly body)	4(fear)
	8(embarassed)	8(off limits)
Information	7(want to learn)	2(understanding)
	9(told)	7(advisement)
Meaning of having breast cancer	1(scared)	
	2(fatalistic)	
	11(hope)	6(positive outlook)
Routine	3(other priorities)	1(taking time)
	5(won't get it)	3(valuing BSE)
	6(roll with the punches)	5(monitoring)
	10(go to the doctor)	

In order to assess the ability of the components of the BSE Frequency Model to correctly classify women in terms of their BSE frequency, two sets of discriminant analyses were undertaken: one using the BSE subscale scores, and one using the scores based on the item's loadings on the retained eight latent variables. On both occasions, selected demographic variable (age and education) were also included. Complete data were available for 168 participants. When *doers* and *nondoers* were defined according to Definition 1 (Doers, those who do BSE at least once every three months, and nondoers, all others) and subscale scores were used, the model correctly classified 82.74% of all participants on the basis of their subscale scores (Table 18).

Table 18

Percentage of particpants correctly classified by discriminant analysis based on BSE subscale scores using Definition 1

Actual group	Number of cases	Predicted group membership	
		Do BSE	Do not do BSE
Do BSE	45	39(86.7%)	6(13.3%)
Do not do BSE	123	23(18.7%)	100(81.3%)

Percentage of "grouped" cases correctly classified: 82.74% (139/168)

As can be seen in Table 19, the subscales contributing the most to the discrimination were Subscales 1, 3, 8, and 9.

Table 19

Standardized canonical discriminant function coefficients for BSE subscale scores using Definition 1

Subscale	Discriminant coefficients
1(scared)	0.151
2(fatalistic)	0.094
3(other priorities)	0.766
4(ugly body)	0.095
5(won't get it)	0.039
6(roll with the punches)	-0.060
7(want to learn)	-0.026
8(embarassed)	0.189
9(told)	0.103
10(go to the doctor)	0.041
11(hopeful)	0.044

When *doers* and *nondoers* were defined according to Definition 2 (Doers: do BSE every month; Nondoers: all others), and subscale scores were used the model correctly classified 83.93% of the participants on the basis of their subscale scores (Table 20).

Table 20

Percentage of participants correctly classified by discriminant analysis based on BSE subscale scores using Definition 2

Actual group	Number of cases	Predicted group membership	
		Do BSE	Do not do BSE
Do BSE	103	86(83.5%)	17(16.5%)
Do not do BSE	65	10(15.4%)	55(84.6%)

Percentage of "grouped" cases correctly classified: 83.93% (141/168)

As can be seen in Table 21, the primary contributing discriminators were subscales 1, 3, 4, 5, 6, and 8.

Table 21

Standardized canonical discriminant function coefficients for BSE subscale scores using Definition 2

Subscale	Discriminant coefficients
1(scared)	0.236
2(fatalistic)	-0.104
3(other priorities)	0.229
4(ugly body)	0.248
5(won't get it)	-0.251
6(roll with the punches)	-0.250
7(want to learn)	-0.082
8(embarassed)	-0.224
9(told)	-0.012
10(go to the doctor)	-0.037
11(hope)	0.044

When *doers* and *nondoers* were defined according to Definition 1 (Doers, those who do BSE at least once every three months; Nondoers, all others), and scores based on items loadings on the latent variables were used, the model correctly classified 85.26% of the participants on the basis of their scores (Table 22). These calculations were based on n=158 since latent variable scores were only available for those participants whose responses were factor analyzed.

Table 22

Percentage of participants correctly classified by discriminant analysis based on latent variable scores using Definition 1

Actual group	Number of cases	Predicted group membership	
		Do BSE	Do not do BSE
Do BSE	41	38(92.7%)	3(7.3%)
Do not do BSE	115	20(17.4%)	95(82.6%)

Percentage of "grouped" cased correctly classified: 85.26% (133/156)

As can be seen in Table 23, the latent variables contributing the most to the discrimination were variables 1 (setting priorities), 3 (valuing BSE), and 4 (terrifying).

Table 23

Standardized canonical discriminant function coefficients for latent variable scores using Definition 1

Latent variable	Discriminant coefficients
1(taking time)	0.893
2(understanding)	0.163
3(valuing BSE)	0.329
4(terrifying)	0.444
5(monitoring)	0.188
6(positive outlook)	0.211
7(advisement)	0.090
8(off limits)	0.272

When *doers* and *nondoers* were defined according to Definition 2 (Doers, those who do BSE every month, and Nondoers, all others), and latent variable scores were used, the model correctly classified 85.26% of the participants on the basis of their scores (Table 24).

Table 24

Percentage of participants correctly classified by discriminant analysis based on latent variable scores using Definition 2

Actual group	Number of cases	Predicted group membership	
		Do BSE	Do not do BSE
Do BSE	95	80(84.2%)	15(15.8%)
Do not do BSE	61	8(13.1%)	53(86.9%)

Percentage of "grouped"cases correctly classified: 85.26% (133/156)

As can be seen in Table 25, the contributing discriminators were latent variables 1 and 4.

Table 25

Standardized canonical discriminant function coefficients for latent variable scores using Definition 2

Latent variable	Discriminant coefficients
1(taking time)	0.987
2(understanding)	0.226
3(valuing BSE)	-0.055
4(terrifying)	0.307
5(monitoring)	-0.101
6(positive outlook)	0.067
7(advisement)	0.001
8(off limits)	-0.220

In both sets of analysis, *nondoers* were classified correctly more often using Definition 1, while *doers* were more often classified correctly using Definition 2. Definition 1 was the definition of a *doer* and *nondoer* used by women in the qualitative phase of the study, and hence, it was the definition around which the subscales were developed. According to Definition 1, the *nondoers* included only those women who defined themselves as such. As noted earlier, the *nondoers* in Definition 2 included not only the *nondoers* as defined by the women themselves, but also, it included those who did BSE once every two or three months and defined themselves as *doers*.

As a final test of the BSE Frequency Model, stepwise multiple regression with specified ordering was conducted. The dependent variable was *doing BSE*. As can be seen in Table 26, using Definition 1, sets of latent variables entered as specified in the model (step 1—off limits, fear; step 2—understanding, sources of endorsement; step 3—positive outlook; and step 4—taking time, valuing BSE, and monitoring), accounted for 41% of the variance in BSE frequency. Age, education, and SES did not contribute to the prediction of BSE frequency over and above the first four variables entered into the regression equation.

Table 26

Prediction of BSE frequency (Definition 1) using BSE Frequency Model

Step	Subscale	Increase in R^2	Significance
1	off limits	0.076	0.045
	fear		<0.001
2	understanding	0.011	0.218
	sources of endorse.		0.518
3	positive outlook	0.011	0.081
4	taking time	0.303	<0.001
	valuing BSE		0.009
	monitoring		0.162
5	age	0.005	0.308
6	education	0.000	0.977
7	SES	0.000	0.587

As can be seen in Table 27, using Definition 2, sets of latent variables entered as specified in the model (step 1—off limits, fear; step 2—understanding, sources of endorsement; step —positive outlook; and step 4—setting priorities, valuing BSE, and monitoring) accounted for 45% of the variance in BSE frequency. Age and SES did not contribute to the prediction of BSE frequency over and above the first variables, but education accounted for an increase of 8.2% in the proportion of criterion variance.

Table 27

Prediction of BSE frequency (Definition 2) using BSE Frequency Model

Step	Subscale	Increase in R^2	Significance
1	off limits	0.038	0.042
	fear		0.001
2	understanding	0.012	0.082
	sources of endorse.		0.638
3	positive outlook	0.000	0.454
4	taking time	0.403	<0.001
	valuing BSE		0.666
	monitoring		0.260
5	age	0.000	0.057
6	education	0.082	<0.001
7	SES	0.004	0.274

Clarification of the BSE Frequency Model

Based on these findings, the BSE Frequency Model was slightly modified following the qualitative phase of the study. The benefits of methodological triangulation are readily apparent in the fuller definition of the key characteristics of women who do and do not do BSE.

The first characteristic, initially labelled *social context*, identified the importance of being in a social context that allowed one to acquire a "take care" meaning for the type of touch required by BSE. Based on the latter part of this study, it seems that the social context must also allow women to acquire a new perception of what it would be like to have breast cancer. Thus, this characteristic has been redefined to include the fourth latent variable (terrifying) as well as items from latent variable 8 (off limits) and has been relabelled *socially connected*. Those who are not *socially connected* will probably never do BSE. Those who are *socially connected* will be comfortable enough touching themselves to consider doing BSE and will be less terrified by the thought of having breast cancer.

The second characteristic, initially labelled *believe information*, was related to what women had to know in order to do BSE. The two latent variables included in this characteristic (i.e., understanding and advisement) suggest that being told to do BSE by others, particularly one's physician, is important. In order to capture the understanding and advisement components of this characteristic, it has been renamed *convincingly informed*. It is composed of items from latent variables 2 (understanding), and 7(advisement).

The third characteristic, initially labelled *meaning of having breast cancer*, was thought to include the process of accepting vulnerability to breast cancer and coming to terms with what having breast cancer would mean. It now appears that the central aspect of this characteristic is a postive outlook. Women who do BSE are more likely to be surprised by the unexpected brightness of their futures. Their futures excite them and would be relatively unaffected, in their minds, by an alteration in body image such as would result from a mastectomy. This characteristic has thus been renamed *positive outlook*. It is composed of items from latent variable 6 (positive outlook).

The fourth characteristic, initially labelled *routine*, involved creating a balance between society's expectations and personal health needs. This component remained largely unchanged. Women who had a routine that included BSE appear to place a high priority on doing BSE, "kept an eye on things," and "didn't take chances" with their health. The women who do not do BSE appear to think BSE is relatively unimportant, deal with health problems when they happen, and "hedge their bets" regarding health matters. To reflect the importance of balancing personal needs with society's expectations, as opposed to arranging one's priorities to favor one or the other, this characteristic has been relabelled *balanced organized*. It is comprised primarily of items from latent variable

1 (taking time), 3 (valuing BSE) and 5 (monitoring). The revised BSE Frequency Model appears in Figure 5.

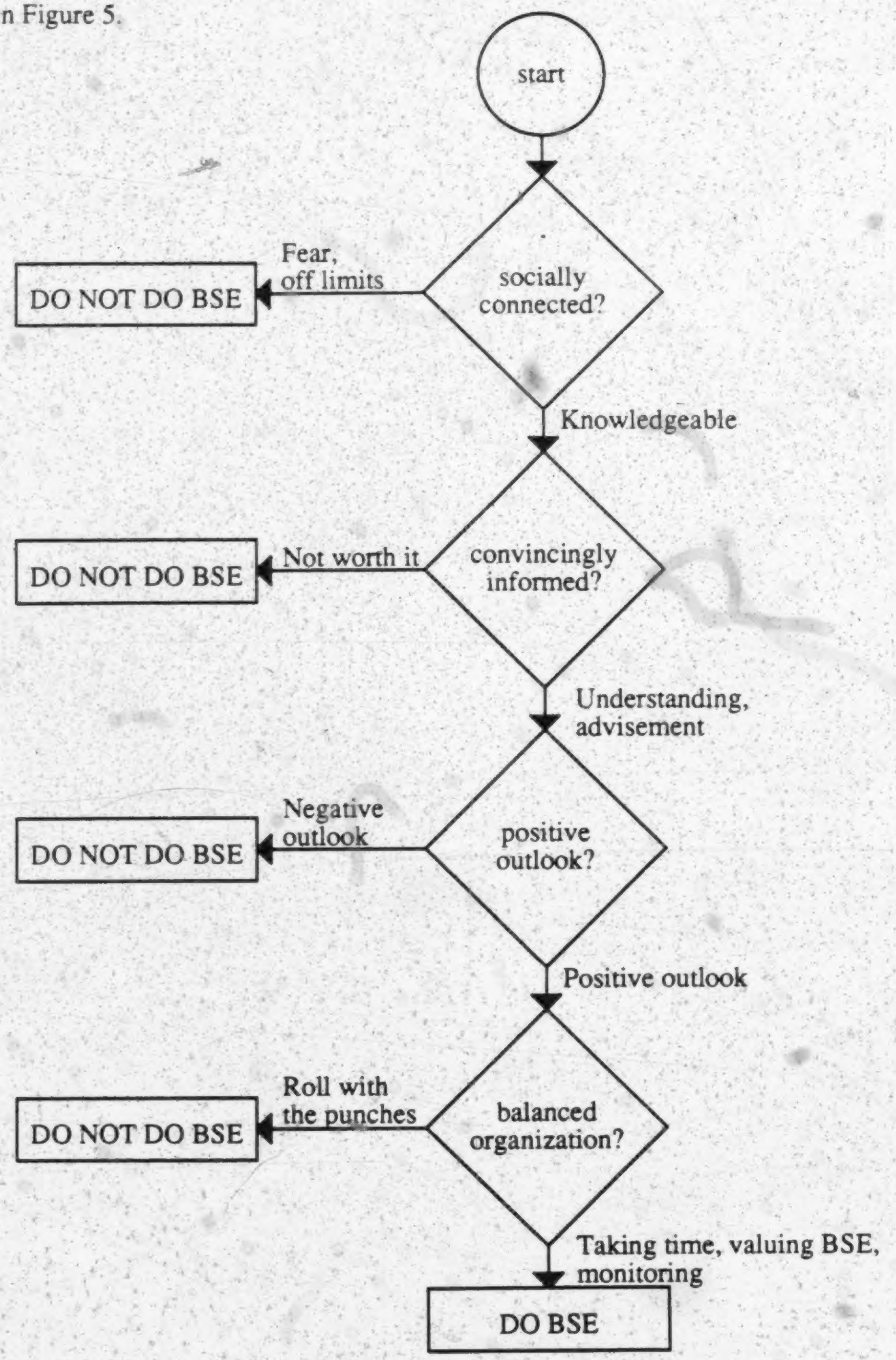
start
socially connected?
Fear, off limits
DO NOT DO BSE
Knowledgeable
convincingly informed?
Not worth it
DO NOT DO BSE
Understanding, advisement
positive outlook?
Negative outlook
DO NOT DO BSE
Positive outlook
balanced organization?
Roll with the punches
DO NOT DO BSE
Taking time, valuing BSE, monitoring
DO BSE

Figure 5: Revised model of factors associated with doing and not doing of BSE.

CHAPTER VI: DISCUSSION

In this chapter, the BSE Frequency Model will be compared with others that have been used to investigate BSE practice. The discussion will include findings of both the qualitative and quantitative phases of the study. Questions posed in the first chapter will also be answered, and the limitations of the study will be outlined.

Demographic variables

While none of the usual demographic variables were identified as particularly important during the qualitative phase of the study, the effects of age, education, and SES were explored in the quantitative phase, due to conflicting findings of other studies. In the context of the eight latent variables (taking time, understanding, valuing BSE, fear, monitoring, positive outlook, advisement, and off limits) and age, education was a significant predictor of BSE frequency using Definition 2 (doers defined as those who did BSE monthly), accounting for 8.2% of the variance (p=.001). However, it did not increase the proportion of explained variance in the context of the eight latent variables and age when BSE frequency was based on Definition 1 (doers defined as those who did BSE every three months). Upon further investigation, education was postively correlated with BSE frequency among women under 45 years of age (*r*=0.131) and negatively correlated for women 45 years of age or older (*r*=-0.070). These findings were not significant since the *r* required for significance if df=100 and alpha =0.05 is 0.195. As noted earlier, both Howe (1981) and Champion (1987) found a positive association between education and BSE frequency. Since a random sample was not used in this study, the above finding may be an artifact of the data. On the other hand, it may be that information designed to convince women to do BSE monthly is too difficult for women with less education to understand. During the interviews, women talked about the complexity of the language used to describe BSE and speculated that some women may have difficulty understanding it.

Attitudinal variables

Several attitudinal variables identified in other studies were also identified in this study. Hailey (1987) notes that those who worried about **getting** breast cancer were more likely to do BSE. A similar finding was also noted in this study. During the interviews, some women said they did not do BSE, as a result of their fear of **finding** breast cancer. Others said that they did BSE because if they got breast cancer they wanted to **find** it early. The relationship between the fear of **getting** breast cancer and the fear of **finding** breast cancer is unclear, but the correlation between the two is likely quite high. Items related to the fear of **finding** breast cancer and the fear of **getting** breast cancer loaded on latent variable 4 (terrified).

Howe (1981) found that those who were uncomfortable talking about breast concerns were less likely to do BSE. She suggests that since BSE was not openly discussed, women may be unsure about whether it is an appropriate practice in which to engage. That finding was supported in this study.

The first characteristic of the revised BSE Frequency Model, *socially connected*, is comprised of items related to the fear of **finding** and/or **getting** breast cancer (4 — terrified) and embarrassment (8 — off limits). Thus, these items were entered into the multiple regression equation first. Together, they accounted for 7.6% (p=.003) of the variance in BSE frequency when Definition 1 was used and 3.8% (p=.053) of the variance in BSE frequency when Definition 2 was used. These findings suggest that those who do BSE at least once every three months (definition 1) are also less fearful about **finding** or **getting** breast cancer and find it less embarassing. *Social connection* is more characteristic of women who do BSE at least once every three months compared to women who do BSE every month.

Hallal (1982) and Rutledge (1987) both report a strong positive correlation between self-esteem and BSE frequency. Based on these findings, women were asked to talk about whether they thought women with high self-esteem were more likely to do BSE. These women said that while self-esteem *per se* may not be related to doing BSE "liking one's body" and "having alot to look forward to" were related to doing BSE. The body image items did not load on any of the latent variables. According to the BSE Frequency Model, the items relating to "having a lot to look forward to" loaded as a group on latent variable 6 and comprised the third characteristic (*positive outlook*) of women who do BSE. However, when latent variable 6 (*positive outlook)* was entered into the multiple regression equation, in the context of the first (latent variables 4 and 8) and second (latent variables 2 and 7) characteristics, it accounted for only 1.1% of the variance in BSE frequency (Definition 1), and it did not increase the proportion of explained variance at all when Definition 2 was used. These findings suggest that although women identified the importance of having a *positive outlook* during the interviews the association between outlook, as measured in this study, and the decision to do BSE is small when viewed in the context of latent variables 2 (understanding), 4 (terrified), 7 (advisement), and 8 (embarassed).

Educational variables

Many studies have discussed the importance of a sense of confidence (Keller et al., 1980; Edwards, 1980; Bennett et al., 1983; Assaf et al., 1985). In these studies, a "sense of confidence" was derived from the perception that one could find a lump (breast cancer) if, in fact, it was present. This study did not support that finding. Some women frequently commented that they were certain that if they checked their breasts, they would find a lump "for sure." In that case, their confidence in their ability to find a lump seemed to prevent them from undertaking BSE.

The results of the qualitative phase of this study supported the findings of Edwards (1980), Keller et al. (1980), Celantano and Holtzman (1983), Worden et al., (1983), Brailey (1986), and Champion (1989) regarding the importance of formal instruction and the findings of Howe (1980), Roberts, French, and Duffy (1984), Champion (1985), and

Lauver (1989) regarding the importance of knowledge. During the interviews, women talked about the "stuff you have to know" in order to do BSE and how this knowledge could be acquired. It was surprising to find that the items related to being shown how to examine one's breasts and knowing how to examine one's breasts had low loadings on several factors. Four items related to understanding the information about BSE loaded together (latent variable 2 — understanding).

Health care system variables

Walker and Glanz (1986) based their study of a stratified random sample of 264 women from a private suburban university on a conceptual framework that included most of the determinants of BSE explored in other studies. These included general health orientation, social influence, normative belief, health evaluation, doctor's encouragement to practice BSE, BSE instruction, worth of medical check-up, encouragement for regular checkups by doctors, attitudes toward the rights and status of women, perceived susceptibility to breast cancer, perceived severity of breast cancer, belief in the efficacy of BSE, perceived costs and benefits of doing BSE, and valence (perceived desirability of benefits). Information regarding frequency of BSE was obtained by asking women how often they examined their breast for lumps or other problems. The response choices for the BSE frequency question were monthly, every two months, every 3 to 6 months, less frequently than every 6 months, never. Six of the study variables had statistically significant regression coefficients, explaining 34.9% of the variance. The extent to which a woman's physician had encouraged her to do BSE entered at step 1 and accounted for 16.6% of the variance in BSE frequency. Other significant predictors, in order of their entry into the regression equation, were normative belief (8.3%), BSE instruction (4.9%), evaluation of health care recently received (2.5%), and a composite variable (the product of belief in efficacy and the difference between perceived severity and perceived susceptibility) (1.3%) and perceived costs and benefits (1.2%).

In the present study, the second characteristic of the BSE Frequency Model, *convincingly informed*, was comprised of items related to encouragement from a physician to do BSE (latent variable 7—advisement) and being able to understand the information about BSE (latent variable 2—understanding). When taken in the context of the first characteristic (latent variable 4—terrifying and latent variable 8—off limits), items related to this second characteristic explained only 1% of the variance in BSE frequency (Definition 1 and Definition 2). These findings suggest that although women identified the importance of understanding information about BSE and being advised to do BSE during the interviews the association between these variables, as measured in this study, and the decision to do BSE is small when viewed in the context of latent variables 4 (terrified) and 8 (embarassed).

The BSE Frequency Model and the Health Belief Model

The key concepts used to predict health behaviour in the Health Belief Model (HBM) are perceived susceptibility, perceived severity, and perceived benefits/barriers. Perceived susceptibility (risk) and perceived severity were thought to create a psychological state of readiness. Many investigators did not investigate "perceived severity" because they assumed that all women would believe that having breast cancer would have very serious implications for their lives. Thus, in most studies, readiness to do BSE was conceptualized as being a function of perceived susceptibility. Those who based their studies on the HBM hypothesized that if a women believed that she was susceptible to breast cancer and believed that the benefits associated with doing BSE (e.g., finding breast cancer early) outweighed the negative aspects of doing BSE (e.g., time consuming) she would practice BSE regularly.

Although frequency of BSE was always based on self-report in the studies using the HBM as their conceptual base, it was operationalized in a variety of ways. Hallal (1982) found that out of a convenience sample of 207 women 25% said they did BSE monthly, 11% said they did BSE between 6 and 11 times per year, 44% said they did BSE between 1 and 5 times per year, and 20% said they never did BSE. All of those who did BSE at least once per year categorized themselves as "doers" of BSE. Champion (1985) found that out of a convenience sample of 301 participants 10% did BSE more than once per month, 29% did BSE once per month, 14% did BSE once every two months, 16% did BSE once every three to four months, 15% did BSE once every 5 to 6 months, and the remainder did BSE less than once every six months. These groups were coded so that those who did BSE were assigned a value of 6, those who did BSE less than once every 6 months were assigned a value of 1, and the remaining groups were assigned values from 2 through 5. The same categories were used in her later study (Champion, 1987). At that time, she studied a convencience sample of 585 women and found that 33% reported examining their breasts monthly, and 11% stated that they examined their breasts more frequently. The proportion of individuals in the remaining categories was not reported. Hill et al. (1985) found that out of a convenience sample of 123 women BSE practice ranged from "more than monthly" (coded as 7) to "not at all" (coded as 1). One quarter of the sample did not do BSE at all, and 17% reported practicing BSE monthly or more often. The percentages for the remaining categories were not reported. Lashley (1987) found that out of a convenience sample of 105 participants 61% of her sample reported doing BSE monthly, and 15% reported doing BSE at least once every other month. On the other hand, 19% reported not doing BSE at all. Rutledge (1987) found that in her sample of 93 women 16% did BSE monthly or more often, 40% did BSE at least once every other month, 16% did BSE between one and 5 times during the past year, and 28% had not done BSE during the past year. Redeker (1989) found that in her convenience sample of 49 participants 31% were nonpractitioners (BSE twice per year or less), 37% were moderate practitioners (three to eight times per year), and 31% were high practitioners (nine times per year or more). It was not always clear whether the investigator had grouped individuals on the basis of the frequency of their BSE practice prior to the analysis or not. Only

Champion (1985, 1987) and Hill et al. (1985) make specific reference to coding BSE practice. None of the investigators gave a rationale for the categorization of BSE frequency used in their studies. In the interview phase of this present study, women were asked how frequently a woman had to do BSE in order to be called a *doer*. They defined a *doer* as someone who did BSE at least once every three months and a *nondoer* as all others; However, from an epidemiologic standpoint, BSE must be done monthly in order to obtain the desired early detection benefit. For this reason, all testing related to the BSE Frequency Model was conducted using both the women's definition (Definition 1) and the epidemiologic definition (Definition 2) of BSE frequency. Thus, the definition of the dependent variable varied, making comparisons between findings difficult.

Many of the findings from the qualitative phase of this study directly contradict the HBM. Some women felt so susceptible to breast cancer that they were afraid to do BSE. It was almost as if they thought they could cause themselves to get breast cancer by thinking about BSE, hearing about BSE, and/or doing BSE. However, according to the HBM, health behaviour should increase as perceptions of susceptibility increase. According to the BSE Frequency Model, there is a point after which fears regarding the possibility of getting breast cancer seem to prevent individuals from undertaking BSE.

According to the HBM, individuals intending to engage in some health behaviour consciously undertake an assessment during which they determine whether the benefits outweigh the barriers, in light of their knowledge of the perceived susceptibility and severity. Studies based on the HBM show that the only variable consistently associated with BSE frequency is perception of barriers and benefits.

All four of the components of the BSE Frequency Model could be classified as types of barriers to doing BSE. However, during the qualitative phase of the study, informants indicated that women did not necessarily undertake a deliberate assessment of these barriers. It may be that some women are completely unaware of barriers to particular health behaviours. The extent to which this lack of deliberate assessment is causally related to the failure to do BSE remains unclear. According to the BSE Frequency Model, the decision to do BSE takes place within a cultural context where one's values play a role in determining what is considered to be "acceptable behaviour." The cultural context may also influence access to information, one's outlook on life, and one's role perception.. Thus, for some women, their cultural context itself may be a barrier to doing BSE. For example, some health behaviour options that seem perfectly reasonable to a nurse may be ones that some women reject on cultural grounds.

Investigators whose studies have been based on the HBM have acknowledged the influence of "cultural factors," but they have only acknowledged as modifiers of BSE practice. These "cultural factors" have not been defined further, and their influence on BSE frequency has not been evaluated. The BSE Frequency Model, on the other hand, views culture as central to an understanding of BSE frequency and has, in fact, assigned it a gate-keeping function.

The BSE Frequency Model provides an opportunity to examine the central concepts of the HBM more exactly and from within a cultural context. Although the definition of the dependent variable varied from one study to the next, making comparisons difficult, the more specific nature of the BSE Frequency Model may partially explain why it was able to account for a greater portion of the variance in BSE frequency than any of the variations of the HBM used to date (Table 28).

Table 28

Comparison of proportion of variance in BSE frequency explained by HBM and BSE Frequency Model

Investigators	Proportion of variance explained
Hallal (1982)	8.2% (perceived benefits)
Champion (1985)	26.0%
Hill et al. (1985)	21.0%
Champion (1987)	22.0%
Lashley (1987)	6.0%
Rutledge (1987)	27.0%
Redeker (1989)	12.5%
BSE Frequency Model	41.0% (Definition 1)
	54.0% (Definition 2)

The BSE Frequency Model and Locus of Control Theory

According to Health Locus of Control Theory (HLCT), those whose behavioural reinforcement comes from within themselves are more likely to engage in health behaviour than those whose reinforcement comes from a source outside themselves (chance, powerful others). This hypothesis received little support from previous studies of BSE practice and was not supported in this study. By combining the HBM with HLCT, occupation and religion, Redeker (1988) was able to explain 47.5% of the variance in BSE frequency, but only health beliefs contributed significantly (p=0.02). Locus of control was not measured in this study because women who said that they told the doctor that they did BSE monthly when in fact they did not so that he would not be angry, also talked about doing BSE once every two or three months just so they knew "what was happening" with their bodies.

Thus, it seemed that both internality and externality (powerful other) may be associated with doing BSE.

The BSE Frequency Model and the Theory of Reasoned Action

According to the Theory of Reasoned Action (TRA), health behaviour is a function of intention to perform the behaviour. Intention is determined by two additive components: attitudes toward the behaviour and subjective norms. While the method for developing items to measure the components of this model was very similar to that used in this study, the central concepts in the two models are very different. One of the key hypotheses of the TRA is that individuals conduct a complex assessment of the consequence of participating in a given health behaviour. This assessment includes an evaluation of their own beliefs about the health behaviour as well as social pressure to participate in it and results in a decision regarding their intention to perform the health behaviour in question. While there was support for the importance of a woman's attitude toward BSE and its effectiveness in this study (latent variable 3—valuing BSE), the notion of social pressure was essentially absent, except as it related to the woman's relationship with her physician. In the interview phase of this present study, the women talked about doing BSE because their physician "told me to." According to the TRA, their compliance with the physician's advise would be due to the women's desire to "please" their physician. The women, on the other hand, described doing BSE following the physician's advise to do so as being more related to valuing the physician's opinion.

The women in this study said they had little opportunity to find out what other individuals close to them thought about BSE. This was related to the lack of open discussion about BSE. The women frequently said that they had no idea what anyone, except perhaps their doctor, thought about BSE. They did not talk about BSE with their friends or families. There is some question about whether women who are *socially connected* might have more opportunity to find out what others thought about BSE. Since *social connection* provides women with the opportunity to talk about BSE more openly, this is certainly a possibility. The influence of subjective norms was the only TRA model component that tapped the wider cultural context identified in the BSE Frequency Model. None of the other central concepts from the BSE Frequency Model were present in the TRA, which may explain why the BSE Frequency Model was generally able to account for a greater proportion of the variance in BSE frequency, particularly if Definition 2 ("doers" defined as those who did BSE monthly) was used (Table 29).

Table 29

Comparison of proportion of variance in BSE frequency explained by TRA and BSE Frequency Model

Investigators	Proportion of variance explained
Hill et al. (1985)	17%
Hill and Shugg (1989)	32%
Lierman et al. (1990)	39%
BSE Frequency Model	41% (Definition 1) 54% (Definition 2)

As noted above in relation to studies based on the HBM, the definition of BSE frequency in studies based on the TRA varied, making comparisons difficult. Hill et al. (1985) found that out of a convenience sample of 123 women BSE practice ranged from "more than monthly" (coded as 7) to "not at all" (coded as 1). One quarter of the sample did not do BSE at all, and 17% reported practicing BSE monthly or more often. The percentages for the remaining categories were not reported. Hill and Shugg (1989) studied a convenient sample of 654 women. They coded "no BSE in the last year" as 0, "once in the last year" as 1, "every 2 to 3 months" as 2, and "monthly" as 3. Lierman et al. (1990)

coded frequency of BSE in the last six months as 0 for "not at all" up through 6 for "6 or more times in the last 6 months." In the present study, *doer* had 2 definitions: One derivied from the qualitative phase of the study (i.e., at least once every three months), and once based on epidemiologic research, (i.e., monthly).

In an effort to explain a greater proportion of the variance in BSE frequency, Hill and Shugg (1989) developed two composite variables that resemble those identified in this study. Intention, as defined within the TRA, "cognitive barriers" (which was constructed by summing up the scores on variables related to not knowing how to do BSE and being confused about what was normal), and "personal disorganization" (which was constructed by summing up the scores on variables related to forgetting, laziness, and lack of time) accounted for 32% of the variance in BSE frequency. Hill and Shugg do not discuss the number of items in each composite variable nor the internal consistency of the relevant subscales, but according to the brief descriptions provided, "cognitive barriers" is similar to the BSE Frequency Model's *convincingly informed* component , and "personal disorganization" is similar to the *balanced organization* component. According to Hill and Shugg, "cognitive barriers" and "personal disorganization" are examples of perceived barriers, as defined by the HBM. Thus, one could say that perceived barriers, as defined by the HBM, and intention to do BSE, as defined by the TRA, predicted a modest proportion of the variance in BSE frequency in their study.

Answered questions

First question

The first research question posed at the beginning of this study was "What are the factors that inhibit and promote BSE?" As the study evolved, it became clear that the process for establishment of a causal relationship between the factors that were being identified and BSE frequency would exceed the time available. Thus, this question was revised to include only the identification of factors associated with doing and not doing

BSE. The BSE Frequency Model developed in this study identifies four factors or characteristics of women who do and do not do BSE: *socially connected, convincingly informed, positive outlook,* and *balanced organization.*

Second and third questions

The second question was "What would the variables of interest be in a study on BSE if they were derived from semi-structured interactive interviews with women, instead of from the currently used methodologies?" A third, closely related question was "Would the variables identified through interviews be the same as or different from those already identified using other methodologies?" The first variable derived from the interviews was *social context.* This variable was later revised based on the quantitative analysis and called *socially connected.* This variable was comprised of items from latent variable 4 (terrified) and latent variable 8 (off limits). Women who are *socially connected* can talk about doing BSE, at least with their physician, and are less afraid of **getting/finding** breast cancer than women who are not *socially connected.* Both of the components of this characteristic (terrified, off limits) have been studied by others, but they have not been examined in the context of the other characteristics in the BSE Frequency Model. Based on this study, it is proposed that women who are *socially connected* are in a position to consider doing BSE.

The second variable derived from the interviews was *believe information.* This variable was later revised based on the quantitative analysis and called *convincingly informed.* This variable is comprised of items from latent variables 2 (understanding) and 7 (advisement). Women who are *convincingly informed* understand the information about BSE and have been "advised" to do it by a physician. Others have identified the importance of the supportive role of the physician, but not in conjunction with understanding information about BSE. Many investigators have identified the importance of knowledge of BSE in relation to BSE frequency. On the basis of this study, it is proposed that women who are *socially connected* and *convincingly informed* have all they need to begin to do BSE.

The third variable derived from the interviews was *meaning of having breast cancer*. This variable was later revised based on the quantitative analysis and called *positive outlook*. This variable is comprised of items from latent variable 6 (positive outlook). Women who have a *positive outlook* look forward to the future and have many things they still want to accomplish. An association between this variable and BSE frequency has not been reported to date. On the basis of this study, it is proposed that women who are *socially connected, convincingly informed*, and who have a *positive outlook* do BSE irregularly (e.g., do some BSE but less than at least once every three months).

The fourth variable derived from the interivews was *routine*. Based on the quantitative analysis, this variable was renamed *balanced organization*. Women who have *balanced organization* have succeeded in integrating their personal health needs with the expectations others have of them in such a way that neither outweighs the other. This variable is comprised of items from latent variable 1 (taking time), 3 (valuing BSE), and 5 (monitoring). All of these variables have been identified by others, but they have not been considered as a group.

Fourth question

The fourth question was "Would the variables identified in the interviews better predict BSE frequency than the variables of the currenly used models?" The variables of the BSE Frequency Model and education were able to predict a greater proportion of the variance in BSE frequency than any other model reported to date. This finding must be interpreted cautiously, however, since the definition of the BSE frequency varied.

Fifth question

The fifth question was "How effectively could the variables identified in the interviews classify individuals in terms of their BSE frequency?" The variables identified in the interviews classified 85% of the participants in the study correctly in terms of their BSE frequency.

Only Champion (1987), Redeker (1989), and Lierman et al. (1990) attempted to classify participants according to BSE frequency based on their models using discriminant analysis. Once again, the definition of BSE frequency varied. Champion divided individuals into three groups: those who examined every 5 to 6 months or less, those who examined every 2 to 4 months, and those who examined at least every month. She correctly classified 54% of the participants in her study based on perceived barriers and perceived susceptibility components of the HBM and knowledge about BSE. Redeker also divided individuals into three groups: twice per year to not at all, three to eight times per year, and nine or more times per year. She correctly classified 65% of the participants in her study based on health beliefs, internal health locus of control, occupation, and religion. Lierman et al. divided individuals into two groups: those who had done BSE 0 to 3 times in the last 6 months and those who had done BSE 4 to 6 times in the last 6 months. They correctly classified 76% of the participants in their study based on the attitude and social norm components of the TRA. In this present study, participants were divided into two groups: those who did BSE at least once in the last three months and all others. Using the BSE Frequency Model variables and education, 85% of the participants were correctly classified. When the definition of the two groups was changed to those who did BSE monthly and all others, the proportion of participants correctly classified remained the same. Although comparisons are difficult due to the variation in definition of BSE frequency, the BSE Frequency Model variables appear to permit better classification of participants on the basis of BSE frequency than other models used to date.

Limitations of the study

Several limitations are apparent in this study. First, the questionnaire response rates for both the instrument development and model validation phases of the study were low. Efforts to obtain demographic characteristics of the populations surveyed, attempted in order to determine whether those who completed the questionnaire were representative of the population as a whole, proved unfeasible.

Second, while the true population of interest was English speaking Canadian women, only a convenience sample drawn from several different subsets of that population was obtained. While the sample was relatively heterogenous with respect to both the demographic and model variables, it is unlikely that it is statistically representative of the population of interest.

Third, although the sample size was within the minimium requirements for factor analysis, it was small. Additional participants would have allowed greater confidence in the findings.

CHAPTER VII: IMPLICATIONS FOR FURTHER RESEARCH AND PROGRAM DEVELOPMENT

Implications for further research

This study raised many significant questions requiring further investigation. The first group of questions relates to the BSE subscales. Since the factor analysis showed that the original 11 subscales comprised 8 latent variables, additional work should be undertaken to confirm and refine these variables. Some of the latent variables are comprised of considerably more items than others, and several of them have fewer than six items. Future work should focus on developing additional reliable and valid items for the latent variables with less than six items. Since the interview data from the qualitative phase of this study has been computerized and coded, the development of additional items would not be difficult.

Once more reliable subscales are obtained, a random sample should be drawn and normative data obtained. Repetition of the factor analysis and discriminant analysis undertaken in this study would assist in the further validation of the BSE Frequency Model. Other methods for testing the model more directly must also be explored. This step would complete the sequential triangulation, complementing the model obtained in the qualitative phase of this study.

With the validation of the model finished, investigation of the relationships between the components of the model should be undertaken. For example, in this study, it was proposed that *social connection* provides the context within which to consider doing BSE, *convincing information* provides the knowledge, skill, and motivation necessary to do BSE, and *positive outlook* and *balanced organization* foster sustained regular BSE practise. The sequential aspect of this hypothesis could be tested using Path Analysis. Additional hypotheses requiring investigation include:

> Women who are *socially connected* are more likely to do BSE
> than women who are not.

Women who are *convincingly informed* are more likely to do BSE than those
who are not.

Women who have a *positive outlook* are more likely to do BSE than those
who do not.

Women who possess *balanced organization* are more likely to do
BSE than those who do not.

This could be done by conducting MANOVA on the composite variables formed on the basis of the latent variable scores.

The relationship between the 11 categories of characteristics of those who do and do not do BSE and the four concepts in the BSE Frequency Model also provides a rich area for further investigation. For example, each of the concepts in the model imply a process (e.g., connecting, converting, and so on) that could be explored using Grounded Theory. The structure of the process has shown itself to some degree through the item loadings. For example, *social connection* was comprised primarily of items from factors 8 (off limits) and 4 (fear). Variations of these concepts may represent stages or phases in the process of becoming *socially connected*.

Another important area for further investigation is the exploration of how the BSE Frequency Model might apply to other early detection health behaviours such as going for HIV testing, monitoring blood pressure, or acknowledging and seeking health care for early symptoms of some health problems. Last, although early detection behaviour was poorly predicted using risk reduction models, a generalized version of the BSE Frequency Model might be useful in predicting risk reduction behaviours such as smoking cessation or seatbelt use.

Implications for program development

According to the BSE Frequency Model, it is proposed that women can be divided into four groups: those who will probably never do BSE (not *socially connected*), those who would do BSE given certain conditions (those *socially connected* but not *convincingly informed*), those who do BSE irregularly (those *socially connected* and *convincingly informed* but lacking a *positive outlook*), and those who do BSE regularly (those *socially connected* and *convincingly informed* with a *positive outlook* and *balanced organization*). It is somewhat premature to make program development suggestions since analysis of normative data has not yet been completed. Nevertheless, several points relevant to breast cancer early detection programs (BCEDP) were noted and are unlikely to change markedly in the future.

First, an understanding of the importance of the cultural context within which BSE does or does not take place is crucial. Care must be taken to ensure that all program components are culturally sensitive. For example, since BSE is not a topic discussed openly, a media advertisement strategy, if used at all, must be organized very carefully. While tasteful advertisements might assist in the establishment of a *social connection* conducive to BSE for some women, they could further alienate others. Scheduled instructional media programs, however, that individuals could watch or hear if they chose might be more acceptable. Simple written information that a woman could read in the privacy of her own home might also be helpful. Regardless of the strategy, the content should focus on the cultural acceptability of doing BSE and strive to present a realistic picture of breast cancer (e.g., 80% of breast lumps are not cancerous, survival rate of women whose cancer found early is high, and cancers found early respond well to conservative medical treatment).

Second, since some women are unlikely to ever do BSE, responsibility for the early detection of their breast cancers falls on the health care system. Thus, nurses and physicians must be encouraged to include a complete breast examination as part of the physical examination protocol for all female patients. Health care professionals should also stress the importance of doing BSE and use this opportunity to teach those who are interested how to do BSE. The teaching of BSE can be a time consuming process, frequently requiring 15 to 20 minutes if a return demonstration is done; consequently, thought should be given to making the teaching of BSE a billable service under the provincial health care insurance plan. Such an undertaking would require that physicians and nurses know how to properly examine the breast and how to teach BSE. Due to the private nature of BSE, women may be more comfortable in the teaching situation if the teacher is also a woman. In a study of 223 women who received teaching regarding BSE from a nurse, Shamian and Edgar (1987) found that nurses' teaching had a positive effect on knowledge of breast cancer, knowledge of the steps in performing BSE, and BSE frequency. Given the long lead time bias associated with some breast cancers, women should be encouraged to have mammograms yearly once they are over 40 years of age, particularly if their risk of developing breast cancer is increased. These strategies will assist in the early detection of breast cancer, particularly in women who are unlikely to do BSE, and provide information about BSE for those wishing to know more about it.

Third, regarding *convincing information*, methods of providing the knowledge, skill, and motivation necessary to do BSE may require revision. In the interview phase of this study, the women frequently mentioned that they "knew all about BSE" but did not do it. As mentioned above, teaching must be done privately. Teaching a woman to do BSE using her own breasts rather than silicone models is recommended. There is some suggestion that younger and older women do BSE for different reasons. If this proves to be the case, once analysis of the normative data is completed, it would be important to develop separate educational materials that stress the factors important to each group of women.

The third and fourth characteristics are more closely related to personality traits and as such are more difficult to address within a program context. Women with a *positive* *outlook* had faced difficult circumstances in their lives and had actively redirected their futures. Their attitude was one of flexibility. Women with *balanced organization* had found ways to accommodate both their own personal needs and society's expectations of them. Strategies must be found to assist women who do not posses these traits but who wish to do BSE. Qualitative studies of the process of developing a *positive outlook* and *balanced organization* will be of great assistance in this regard. Some suggestions initially devised in the clinical setting have proven helpful for assisting these women. For example, women have been taught to chart their menstrual cycle on a calendar and underline days 10 to 14 in order to remind themselves to check their breasts. Women who are no longer menstruating have been taught to chose a day every month (e.g., first Saturday) and underline it on their calendar to remind themselves to check their breasts. Perhaps calendars or calendar stickers marked with "BSE Day" could be developed.

Conclusion

Breast cancer continues to be a major cancer killer of Canadian women. Various screening methods appear beneficial in the detection of many breast cancers while they are still favorably responsive to treatment. Despite the lack of consistent empirical evidence, many clinicians are of the opinion that BSE is particularly helpful in detecting those breast cancers that develop between medical examinations. Efforts to encourage women to do BSE regularly have not been successful. Given the conflicting results of previous studies in this area based on existing theories of health behaviour, the purpose of this study was to inductively develop and test a new model of factors associated with doing and not doing BSE. The results of this study offer an explanation of why few women do BSE, and they provide a basis for further research and program development in this area.

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Appendix I: Consent form for qualitative phase

Consent

Consent for interview regarding: WOMEN'S HEALTH CONCERNS

Being conducted by:

Karin Olson
26 Sundance Co-op
Edmonton, Alberta T5H 4B4
(phone: 424-8516)

I, ____________________, agree to be interviewed by Karin Olson in conjunction with her study on women's health concerns. The study has been explained to me and I understand its potential benefits and absence of health risks. I give permission for the interview to be tape recorded, and am assured of anonymity. I understand that I may withdraw from the study at any time without penalty. I am willing to allow my comments to be used in subsequent studies and for educational purposes.

____
informant

____
investigator

____
date

Appendix II: Description of QUAL

QUAL

Qual is written in FORTRANVS (IBM FORTRAN 77) for the Amdahl 5870 computer running the MTS operating system at the University of Alberta. It uses random access line-oriented files to hold the text data. The program may be used for semi-structured interview guides or unstructured, interactive interviews, and provides a rapid method for performing content analysis. Data may be retrieved by interview number, subject, question number, or code. Retrieval order is specified by the investigator. The program is available without charge by sending a message to JMORSEUALTAVS.BITNET. Any modifications to meet the requirements of the host computer are the responsibility of the receiver.

Taken from: Morse, J.M. and Morse, R.M. (in press). QUAL: A mainframe program for qualitative data analysis. Nursing Research.

Appendix III: Descriptors for card sorts

Descriptors from first round of interviews.

1. I feel good about myself.
2. I have alot to look forward to in the future.
3. Although I would probably feel devastated initially if I got breast cancer, I think I would be able to cope with it quite well eventually.
4. I am well informed about things related to my health.
5. The doctor showed me how to do breast self examination.
6. I know what I'm looking for when I do breast self examination.
7. I think breast self examination is a way of finding breast cancer while it still has a good chance of being cured.
8. There is time in my life for me.
9. I think breast cancer has a good chance of being cured if its detected early enough.
10. I am generally in tune with my body.
11. I want to run my life.
12. I try to do everything I can to keep myself healthy.
13. If I found something when I was doing my breast self examination, I'd make an appointment to go see the doctor right away.
14. Breast self examination is part of what I do to keep myself healthy.
15. I have a family history of breast cancer.
16. Its reassuring to not find anything when I check my breasts.
17. I know someone who was recently diagnosed with breast cancer.
18. I worry about what would happen to my family if I died from breast cancer or something like that.
19. I've already had one lump removed from my breast.
20. As I get older, I get a little more concerned about all the things that I could get, like breast cancer.
21. Something reminds me to do breast self examination.
22. The doctor told me I should do breast self examination.
23. I've heard alot of stories recently about women with breast cancer.
24. I think there is a chance I could get breast cancer.
25. I've read alot about the importance of doing breast self examination and I guess it just finally sunk it.
26. I don't read very well so its hard to get information.
27. I don't know very much about breast self examination because its so hard to get to the doctor ---I can't get time off work very easily, and even if I could, I'd have to take three buses.
28. I've gone through menopause and so I figured all my "female problems" were over.
29. I have too many other health problems right now.
30. I've never heard about breast self examination.
31. I figure that if you're going to get breast cancer, you're going to get it.
32. I leave things like breast examination to the doctor.

33. I just don't have time to think about breast self examination.
34. I'm too busy to do breast self examination.
35. I don't like to touch my body like that. Its against the way I was brought up.
36. I doubt that I will ever get breast cancer.
37. I just feel sort of immortal---I really don't think anything serious will ever happen to me.
38. I think most of the lumps women find in their breasts are breast cancer.
39. I think most people who get breast cancer eventually die of it.
40. Doing breast self examination isn't worth the effort because I never find anything.
41. Breast self examination just isn't part of what I do to stay healthy.
42. I think doing breast self examination is too much of a big deal---you have to do it at a certain time each month, do certain steps, hold your hand just right. If I get some part wrong or am a couple of days late, I just feel like I might as well not do it.
43. I don't really need to do breast self examination because I'm healthy.
44. I really don't know what I'm looking for when I'm doing breast self examination.
45. Breast self examination takes too long.
46. The more they tell you about breast cancer, the more you think you're going to get it and so you just try to forget the whole thing, including things related to it like breast self examination.
47. I'm afraid I might find something when I'm doing breast self examination.
48. I really don't know if I'm doing breast self examination right.
49. I just don't like to be looking for cancer.
50. I just don't think of breast self examination.
51. I've heard that just older women get breast cancer, not young ones like me.
52. I just don't understand breast self examination.
53. I've never been taught how to do breast self examination.
54. I really don't like my body and so I don't feel like taking care of it.
55. The doctor tol me about why I should do breast self examination, but I think I sort of figure if I don't listen to him, I just won't get breast cancer.
56. I'm really not educated enought to know about things like breast self examination.
57. The doctor has never mentioned breast self examination to me.
58. Breast cancer is just not a big worry for me right now.
59. There is almost no cancer in my family.

60. I have too many other problems right now---I hate my job and things at home are not the greatest.
61. I've hear that even people who do breast self examination on a regular basis miss lumps until its too late.

Appendix IV: Pretest questionnaire information sheet and identification page

Information sheet for the study:

The identification of factors that inhibit and promote breast self examination

Conducted by:
Karin Olson
26 Sundance Co-op
87 St. and 100 Ave.
Edmonton, Alberta T5H 4B4
Phone; 424-8516

The purpose of this information sheet is to briefly explain a study currently being done on breast self examination (BSE). Please feel free to keep it if you wish. This study is being conducted in conjuntion with my doctoral studies.

The aim of the study is to understand the factors that inhibit and promote BSE from the viewpoint of women. The information gained from this project will eventually be used to help develop programs on BSE. Pennisison to conduct this study has been received from the Department of Educational Psychology at the University of Alberta. The study began by interviewing a number of women on this topic. Based on these interviews, some categories of reasons for doing and not doing BSE were identified. These reasons were then used as background for a questionnaire. I am now looking for a small group of women who would be willing to answer the questionnaire in order to check how long it takes to complete and to make sure that the questions are clear. The questionnaire will be revised based on your comments and administered to a larger group of women. The checking process requires that approximately two weeks after you return the questionnaire, a second one exactly the same be sent to you for you to complete and return. For this reason, I have enclosed an identification page on which I have asked you to indicate your name and mailing address. You will also notice that on the bottom of the identification page, I have asked you to consider giving permission for me to keep you questionnaire for other studies and educational purposes. If you are willing to do this, please sign your name and indicate the date in the space provided.

In any written or oral reports of this study, your name will never be asociated with your comments. The only people who will see your answers are my advisors at the University of Alberta and myself. If, at some point in the future, you decide that you would like to have your comments removed from the study, please contact me at the above address or phone number and I will take your comments out of the study with no questions asked. If you have any questions or would like to have something clarified, please do not hesitate to contact me at the above address or phone number.

If you are willing to participate in this study, please complete the identification page and the questionnaire and return them to me in the enclosed envelope.

Thank you for your consideration of this request.

Identification Page for the study: The identification of factors that inhibit and promote breast self examination

I.D. __ __ __

Name ______________________________

Mailing address ______________________________

____

____

I would like to keep your answers to these questions for other studies and to help students learn to analyze this kind of information, but I need your permission in order to do this. Any future studies would be submitted to the appropriate ethics review committee. Your answers would never be associated with your name. If you are willing to let me use your answers in these ways, please sign your name in the space below, and indicate the date. If you do not sign, your answers will only be kept until this study is finished. Thank you for your consideration of this request.

Name ______________________________

Date ____________________

Appendix V: Information sheet and consent form for MN students

Information sheet for the study:

The identification of factors that inhibit and promote breast self examination

Conducted by: Karin Olson
26 Sundance Co-op
87 St. and 100 Ave.
Edmonton, Alta. T5H 4B4
Phone: 424-8516

The purpose of this information sheet is to briefly explain a study currently being done on breast self examination (BSE). Please feel free to keep it if you wish. This study is being conducted in conjunction with my doctoral studies.

The aim of the study is to understand the factors that inhibit and promote BSE from the viewpoint of women. The information gained form this project will eventually be used to help develop programs on BSE. Permission to conduct this study has been received from the Department of Educational Psychology and the Faculty of Nursing at the University of Alberta. The study began by interviewing a number of women on this topic. Based on these interviews, some categories of reasons for doing and not doing BSE were identified. These reasons were then used as background for a questionnaire. I am now looking for a small group of women who would be willing to complete the questionnaire in order to check how long it takes and to make sure the questions are clear. The questionnaire will then be revised and administered to a larger group of women. The checking process requires that approximately two weeks after you return the questionnaire, a second one exactly the same be sent to you for you to complete and return. For this reason, I have requested your mailing address on the consent form.

In any written or oral reports of this study, your name will never be associated with your comments. The only people who will see your answers are my advisors at the University of Alberta and myself. If, at some point in the future, you decide that you would like to have your comments removed from the study, please contact me at the above address or phone number and I will take your comments out of the study with no questions asked. If you have any questions or would like to have something clarified, please do not hesitate to contact me at the above address or phone number.

If you are willing to participate in this study, please complete both copies of the consent and then return one of them and the completed questionnaire in the enclosed return envelope via campus mail.

Thank you for your consideration of this request.

Karin Olson

I. D. _ _ _

Consent for the study:

The identification of factors that inhibit and promote breast self examination .

Being conducted by:

Karin Olson
26 Sundance Co-op
87 St. and 100 Ave.
Edmonton, Alberta
T5H4B4
Phone: 42[illegible]-8516

Purpose of the study

The purpose of this study is to identify the factors that inhibit and promote breast self examination from women's point of view.

The study has been explained to me and I have had an opportunity to have my questions about it answered.

I understand that there are no health risks or personal benefits associated with this study.

I understand that I may drop out at any time by phoning Karin Olson at 424-8516 or by writing to her at the above address and that no one will hold that against me.

I understand that I will not be described as an individual in any articles or talks about this study. My records in this study will only be marked with my identification number, not my name.

I give my permission for my comments to be used by Karin Olson in her lectures to students.

I give my permission for my comments to be used by Karin Olson in other studies she may do. I understand that in this case I will not be described as an individual in any articles or talks about ths study and that my records will only be marked by my identification number as described above. I also understand that permision to do these later studies will be requested from the appropriate ethcis review committee(s).

I understand that I may cross out any part of this consent that I wish.

I have read this information and give my consent to participate in the study:

The identification of factors that inhibit and promote breast self examination

Name ______________________________

Address ______________________________

____

____

Date ______________________________

Appendix VI: Pretest questionnaire

Questionnaire

Here are some statements about breast cancer, breast self examination (BSE), and related matters. Please circle the number in the space below each item that is closest to your feelings. Please underline any words that are unclear to you and keep track of how long it takes for you to complete the questionnaire.

DO NOT WRITE IN THIS COLUMN

I.D. ___ 1 ___ 2 ___ 3

RECORD 1 4

1. I'm afraid that if I check my breast for lumps, I'll find one for sure.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q1. ___ 5

2. I think I will get breast cancer sometime during my life.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q2. ___ 6

3. I can think of lots of things that would be worse than getting breast cancer.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q3. ___ 7

4. Watching a television program about breast cancer would encourage me to do BSE.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q4. ___ 8

5. Just thinking about breast cancer makes women worry they might get it.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q5. ___ 9

Please continue

DO NOT WRITE IN THIS COLUMN

6. Most women would change the channel when programs on breast cancer come on.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q6. ___ 10

7. Most women are afraid to check their breasts for lumps.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q7. ___ 11

8. The chances of any woman getting breast cancer are small.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q8. ___ 12

9. By the time breast lumps are detected using BSE, the disease has progressed too far to be cured.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q9. ___ 13

10. Women whose breast cancer is picked up early are cured of the disease.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q10. ___ 14

11. A woman who gets breast cancer will eventually die of it.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q11. ___ 15

Please continue

DO NOT WRITE IN THIS COLUMN

12 BSE is a good way to find breast lumps that begin between check-ups by the doctor.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q12. 16

13. I doubt that I could find a breast lump early enough for me to be cured.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q13. 17

14. Even though some women survive breast cancer I would die from it if I got it.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q14. 18

15. If I got breast cancer, I could find the lump while it could still be cured.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q15. 19

16. I have less chance of dying of breast cancer if I do BSE regularly.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q16 20

17. I am too busy to think about BSE.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q17 21

Please continue

DO NOT WRITE IN THIS COLUMN

18. I forget to do BSE.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q18. 22

19. I check my breasts for lumps even when I'm sick.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q19. 23

20. Compared to all the other things I have to do, BSE is relatively unimportant.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q20. 24

21 People who value their health should do BSE.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q21. 25

22. A women who doesn't take time to check her breasts for lumps has her priorities on the wrong things.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q22. 26

23. I make time to do BSE even when I'm busy.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q23 27

24. I have no time for myself.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q24. 28

Please continue

DO NOT WRITE IN THIS COLUMN

25. I like the way my body looks.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q25. 29

26. I wish my body looked better.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q26. 30

27. People should take care of their bodies.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q27. 31

28. Taking care of my body takes too much effort.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q28. 32

29. The women I know are happy with the way they look.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q29. 33

30 The women I know would like to change the way they look.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q30. 34

31. A person's appearance is very important.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q31. 35

Please continue

DO NOT WRITE IN THIS COLUMN

32. A person's body is just the shell they walk around in.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q32. 36

33 Even healthy women should do BSE.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q33. 37

34. Women who have other health problems are more likely to get breast cancer.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q34. 38

35. A normal mammogram ensures that I'm safe from breast cancer.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q35. 39

36. I'll do BSE more when I'm older.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q36. 40

37. When I hear about someone who got breast cancer, I check my breasts as soon as possible.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q37. 41

Please continue

38. I would do BSE even if no one in my family had ever had breast cancer.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

39. I would do BSE even if no one I know had breast cancer.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

40. Women only need to check their breasts for lumps if they are likely to get breast cancer.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

41. Its a waste of time be concerned about things that you might never get.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

42. I try to anticipate health problems before they actually happen.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

43. I worry about my health.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Please continue

DO NOT WRITE IN THIS COLUMN

Q38. $\overline{42}$

Q39. $\overline{43}$

Q40. $\overline{44}$

Q41. $\overline{45}$

Q42. $\overline{46}$

Q43. $\overline{47}$

---

44. People should watch themselves closely for health problems.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

45. 'Health nuts' are self-centered.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

46. People who don't try to prevent health problems are being foolish.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

47 Its silly to worry about potential health problems.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

48 Bad things never happen to me.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

49 The information about BSE is hard to understand.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

50 The information about BSE is easy for me to follow.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Please continue

DO NOT WRITE IN THIS COLUMN

Q44. $\overline{48}$

Q45. $\overline{49}$

Q46. $\overline{50}$

Q47. $\overline{51}$

Q48. $\overline{52}$

Q49. $\overline{53}$

Q50. $\overline{54}$

51. Most women find the information about BSE confusing.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

52. Women find the information about breast cancer to be quite straight forward.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

53. Women know where to go for information about BSE.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

54. Women have no idea where they could get information about BSE.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

55. I know where I could get information about checking my breasts for lumps.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

56. I'm unsure about where to get information about BSE.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

DO NOT WRITE IN THIS COLUMN

Q51. ___ 55

Q52. ___ 56

Q53. ___ 57

Q54. ___ 58

Q55. ___ 59

Q56. ___ 60

Please continue

57. The kind of touching you do when you do BSE is against the way I was brought up.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

58. I am comfortable touching myself when doing BSE.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

59. Its O.K. to touch yourself to do BSE.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

60. Women feel too embarrassed about touching themselves to do BSE.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

61. If I ever have a lump in my breast, I don't want to the one to find it.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

62. Women should take some responsibility for finding breast lumps early.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

DO NOT WRITE IN THIS COLUMN

Q57. ___ 61

Q58. ___ 62

Q59. ___ 63

Q60. ___ 64

Q61. ___ 65

Q62. ___ 66

Please continue

63. I look for information about BSE.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

64. If someone gave me a free pamphlet on BSE, I would ignore it.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

65. When I go for my yearly check up, my doctor asks me if I do BSE.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

66. I've never heard about BSE.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

67. Women who say they haven't heard about BSE just weren't paying attention.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

68. My doctor stresses the importance of BSE.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Please continue

DO NOT WRITE IN THIS COLUMN

Q63. ___ 67

Q64. ___ 68

Q65. ___ 69

Q66. ___ 70

Q67. ___ 71

Q68. ___ 72

69. I have never been shown how to check my breasts for lumps.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

70. I know how to check my breasts for lumps.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

71. Women are never told about BSE.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

72. Doctors never discuss BSE with their patients.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

73. People should only go to the doctor when they're really sick.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

74. I go to the doctor on a regular basis.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

75. I only go to the doctor when I feel awful.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Please continue

DO NOT WRITE IN THIS COLUMN

Q69. ___ 73

Q70. ___ 74

Q71. ___ 75

Q72. ___ 76

Q73. ___ 77

Q74. ___ 78

Q75. ___ 79

76. People who go to the doctor when they're not sick are wasting tax payers' money.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

77. It's too much trouble for me to go to the doctor unless I really need to.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

78. A woman should make an appointment to see the doctor right away if she thinks there is something the matter with her.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

79. If I found a lump in my breast I would try to get in to see the doctor as soon as possible.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

80. I would go to see the doctor for a check up even if I lived far away.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

81. My future is brighter than I expected it to be.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

DO NOT WRITE IN THIS COLUMN

Q76. ___ 80

I.D. ___ 1 ___ 2 ___ 2

RECORD 2 4

Q77. ___ 5

Q78. ___ 6

Q79. ___ 7

Q80. ___ 8

Q81. ___ 9

82. I am excited about my future

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

83. I have little to look forward to.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

84. Most people have a happier future than I do.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

85. Most people have alot to look forward to.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

86. I have lots of things I want to accomplish in the future.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

87. People who are always cheerful annoy me.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

88. People who always look on the bright side of things get on my nerves.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Please continue

DO NOT WRITE IN THIS COLUMN

Q82. ___ 10

Q83. ___ 11

Q84. ___ 12

Q85. ___ 13

Q86. ___ 14

Q87. ___ 15

Q88. ___ 16

Below please find a number of statements. Read each one and decide whether it is true or false for you personally. If it is true, circle the T to the right of the statement. If it is false, circle the F to the right of the statement.

			DO NOT WRITE IN THIS COLUMN
89. Before voting, I thoroughly investigate the qualifications of all the candidates.	T	F	Q89. ___ 17
90. I never hesitate to go out of my way to help someone in trouble.	T	F	Q90. ___ 18
91. It is sometimes hard for me to go on with work if I am not encouraged.	T	F	Q91. ___ 19
92. I have never intensely disliked anyone.	T	F	Q92. ___ 20
93. On occasion I have had doubts about my ability to succeed in life.	T	F	Q93. ___ 21
94. I sometimes feel resentful if I don't get my way.	T	F	Q94. ___ 22
95. I am always careful about my manner of dress.	T	F	Q95. ___ 23
96. My table manners at home are always as good as when I eat out in a restaurant.	T	F	Q96. ___ 24
97. If I could get into a movie without paying and be sure I was not seen, I would probably do it.	T	F	Q97. ___ 25
98. On a few occasions, I have given up doing something because I thought too little of my ability.	T	F	Q98. ___ 26
99. I like to gossip at times.	T	F	Q99. ___ 27

Please continue

			DO NOT WRITE IN THIS COLUMN
100. There have been times when I felt like rebelling against people in authority even though I knew they were right.	T	F	Q100. ___ 28
101. No matter who I am talking to, I'm always a good listener.	T	F	Q101. ___ 29
102. I can remember playing "sick" to get out of something.	T	F	Q102. ___ 30
103. There have been occasions when I took advantage of someone.	T	F	Q103. ___ 31
104. I'm always willing to admit it when I make a mistake.	T	F	Q104. ___ 32
105. I always try to practice what I preach.	T	F	Q105. ___ 33
106. I don't find it difficult to get along with loud mouthed, obnoxious people.	T	F	Q106. ___ 34
107. I sometimes try to get even, rather than forgive and forget.	T	F	Q107. ___ 35
108. When I don't know something I don't mind at all admitting it.	T	F	Q108. ___ 36
109. I am always courteous, even to people who are disagreeable.	T	F	Q109. ___ 37
110. At times I have really insisted on having things my own way.	T	F	Q110. ___ 38
111. There have been occasions when I felt like smashing things.	T	F	Q111. ___ 39

Please continue

			DO NOT WRITE IN THIS COLUMN
112. I would never think of letting someone else be punished for my wrongdoings.	T	F	Q112. ___ 40
113. I never resent being asked to return a favor	T	F	Q113. ___ 41
114. I have never been irked when people expressed ideas very different from my own.	T	F	Q114. ___ 42
115. I never make a long trip without checking the safety of my car.	T	F	Q115. ___ 43
116. There have been times when I was quite jealous of the good fortune of others,	T	F	Q116. ___ 44
117. I have almost never felt the urge to tell someone off.	T	F	Q117. ___ 45
118. I am sometimes irritated by people who ask favors of me.	T	F	Q118. ___ 46
119. I have never felt that I was punished without cause.	T	F	Q119. ___ 47
120. I sometimes think when people have misfortune they only got what they deserved.	T	F	Q120. ___ 48
121. I have never deliberately said something that hurt someone's feelings.	T	F	Q121. ___ 49

Now, please answer the following questions about yourself by circling the correct answer or writing a short answer in the space provided below the question.

122. How old are you? — Q122. ___ 50 ___ 51

Please continue

DO NOT WRITE IN THIS COLUMN

123 Please indicate the last year of education you completed
- a. grade 8 or less
- b. grade 9
- c. some high school
- d. grade 12
- e. some vocational training
- f. vocational certificate
- g. some college
- h. some university
- i. college degree
- j. university degree
- k. graduate degree
- l. other (please specify________________)

Q123. ___ 52

124. What is your marital status?
- a. single
- b. married
- c. common-law
- d. widowed
- e. divorced

Q124. ___ 53

125. Do you have any children?
- a. yes (proceed to question 5)
- b. no (proceed to question 7)

Q125. ___ 54

126. Do your children live with you?
- a. yes (proceed to question 6)
- b. no (proceed to question 7)

Q126. ___ 55

127. How old are your children?

Q127. ___ 56 ___ 57

___ 58 ___ 59 ___ 60

___ 61 ___ 62 ___ 63

___ 64

Please continue

Please continue

128. What is your occupation? If married or
living common-law, please also describe partner's job

129. What religious group do you belong to?
    a. Jewish
    b. protestant
    c. catholic
    d. other (please specify________________________)
    e. none

130. Do you examine your breasts for lumps or
other problems?
    a. yes (please proceed to question 131)
    b. no (please proceed to question 132)

131. How often do you examine your breasts?

Thank you for helping with this study

Please indicate how many minutes it took you
to complete this questionnaire _____

DO NOT WRITE IN
THIS COLUMN

Q128 65 66
67 68 69
70

Q129 71

Q130 72

Q131 73 74

Minutes 76 77

Appendix VII: Revised questionnaire

Questionnaire

Here are some statements about breast cancer, breast self examination (BSE), and related matters. Please circle the number in the space below each item that you think is closest to your feelings or the feelings of other Canadian women.

DO NOT WRITE IN THIS COLUMN

I.D. 1 2 3 4

RECORD $\frac{1}{5}$

1. I'm afraid that if I check my breasts for lumps, I'll find one for sure.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q1 6

2. I think I will get breast cancer sometime during my life.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q2 7

3. Thinking about breast cancer makes me worry I might get it.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q3 8

4. Hearing about breast cancer makes me worry I might get it.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q4 9

5. If I found a lump in my breast, it would probably not be breast cancer.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q5 10

6. I think most women are afraid to check their breasts for lumps.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q6 11

7. I think most women worry about getting breast cancer.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q7 12

8. If I ever found a lump in my breast, I am sure I would have to have my breast removed.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q8 13

9. Women whose breast cancer is picked up early are cured of the disease.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q9 14

10. A woman who gets breast cancer will eventually die of it.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q10 15

11. BSE is a good way to find breast lumps that first show up between check ups by the doctor.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q11 16

Please Continue

DO NOT WRITE IN THIS COLUMN

12 I doubt that I could find a breast lump early enough for me to be cured.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q12 17

13 Even though some women survive breast cancer I would die from it if I got it.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q13 18

14 If I got breast cancer, I could find the lump while it could still be cured.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q14 19

15 I have less chance of dying of breast cancer if I do BSE regularly.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q15 20

16 I am too busy to think about BSE.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q16 21

17 I forget to do BSE.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q17 22

Please continue

DO NOT WRITE IN THIS COLUMN

18 I check my breasts for lumps even if I'm sick

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q18 23

19 Compared to all the other things I have to do, BSE is not important

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q19 24

20 People who value their health should do BSE

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q20 25

21 A woman who doesn't take time to check her breasts for lumps has her priorities mixed up.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q21 26

22 I make time to do BSE even when I'm busy

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q22 27

23 I have no time for myself

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q23 28

24 I like the way my body looks

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q24 [illegible]

Please continue

DO NOT WRITE IN THIS COLUMN

25 I wish my body looked better

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q26 30

26 Taking care of my body takes too much effort

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q26 31

27. Other people think I am good looking.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q27 32

28. I think a person's appearance is very important

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q28 33

29. I am less attractive than the average Canadian woman.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q29 34

30. Women who have other health problems are more likely to get breast cancer.

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q30 35

DO NOT WRITE IN THIS COLUMN

31 Women of all ages should do BSE

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q31 36

32 I would do BSE even if no one in my family had breast cancer

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q32 37

33 I would do BSE even if no one I knew had breast cancer

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q33 38

34 Women only need to check their breasts for lumps if they are likely to get breast cancer

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q34 39

35 Only older women need to do BSE

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q35 40

36 Its pointless to worry about diseases you might never get

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q36 41

37 I worry about my health

1 2 3 4 5 6 7
strongly disagree — neither agree nor disagree — strongly agree

Q37 42

Please continue

DO NOT WRITE IN THIS COLUMN

38 People should watch themselves closely for health problems

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q38 43

39 'Health nuts' are self-centered

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q39 44

40 People who never try to prevent health problems are being foolish.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q40 45

41 I wait to deal with health problems until they happen.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q41 46

42 The information about BSE is hard to understand

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q42 47

43 The information about BSE is easy for me to follow

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q43 48

44 I find the information about BSE confusing

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q44 49

DO NOT WRITE IN THIS COLUMN

45 I find the information about breast cancer to be quite straight forward

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q45 50

46 Women know where to go for information about BSE

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q46 51

47 Women have no idea where they could get information about BSE

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q47 52

48 I know where I could get information about checking my breasts for lumps

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q48 53

49 I'm unsure about where to get information about BSE

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q49 54

50 The kind of touching you do when you do BSE is against the way I was brought up

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q50 55

Please continue

DO NOT WRITE IN THIS COLUMN

51. I am comfortable touching myself to do BSE

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q51 56

52. I feel embarrassed about touching myself to do BSE

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q52 57

53. If I ever have a lump in my breast, I want someone else to be the one who finds it first

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q53 58

54. If I ever have a lump in my breast, its O.K. if I'm the one who finds it first.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q54 59

55. The kind of touching you do when you do BSE is O.K. according to the way I was brought up.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q55 60

56. When I go for my yearly check up, my doctor asks me if I do BSE

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q56 61

DO NOT WRITE IN THIS COLUMN

57. I have never heard about BSE

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q57 62

58. My doctor stresses the importance of BSE

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q58 63

59. I've never been shown how to check my breasts for lumps

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q59 64

60. I know how to check my breasts for lumps

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q60 65

61. Women are never told about BSE

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q61 66

62. Doctors never discuss BSE with their patients

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q62 67

63. People should only go to the doctor when they're really sick.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q63 68

Please continue

	DO NOT WRITE IN THIS COLUMN
	I D 1 2 3 4
	RECORD 2 5
76. People who always look on the bright side of things get on my nerves	Q76 __ 6

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Below please find a number of statements. Read each one and decide whether it is true or false for you personally. If it is true, circle the T to the right of the statement. If it is false, circle the F to the right of the statement.

77.	Before voting, I thoroughly investigate the qualifications of all the candidates.	T	F	Q77	7
78.	I never hesitate to go out of my way to help someone in trouble.	T	F	Q78	8
79.	It is sometimes hard for me to go on with work if I am not encouraged.	T	F	Q79	9
80.	I have never intensely disliked anyone.	T	F	Q80	10
81.	On occasion I have had doubts about my ability to succeed in life.	T	F	Q81	11
82.	I sometimes feel resentful if I don't get my way.	T	F	Q82	12
83.	I am always careful about my manner of dress.	T	F	Q83	13
84	My table manners at home are always as good as when I eat out in a restaurant.	T	F	Q84	14

				DO NOT WRITE IN THIS COLUMN	
85	If I could get into a movie without paying and be sure I was not seen, I would probably do it	T	F	Q85	15
86	On a few occasions, I have given up doing something because I thought too little of my ability	T	F	Q86	16
87	I like to gossip at times	T	F	Q87	17
88	There have been times when I felt like rebelling against people in authority even though I knew they were right	T	F	Q88	18
89	No matter who I am talking to, I'm always a good listener.	T	F	Q89	19
90	I can remember playing "sick" to get out of something	T	F	Q90	20
91.	There have been occasions when I took advantage of someone	T	F	Q91	21
92	I'm always willing to admit it when I make a mistake.	T	F	Q92	22
93.	I always try to practice what I preach	T	F	Q93	23
94	I don't find it difficult to get along with loud mouthed, obnoxious people	T	F	Q94	24
95	I sometimes try to get even, rather than forgive and forget	T	F	Q95	25
96	When I don't know something I don't mind at all admitting it	T	F	Q96	26

Please continue

DO NOT WRITE IN THIS COLUMN

64 I go to the doctor on a regular basis.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q64 69

65 I only go to the doctor when I feel awful.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q65. 70

66. People who go to the doctor when they're not sick are wasting tax payers' money.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q66. 71

67. It's too much trouble for me to go to the doctor unless I really need to.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q67. 72

68. A woman should make an appointment to see the doctor right away if she thinks there is something the matter with her.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q68. 73

69. If I found a lump in my breast I would try to get in to see the doctor as soon as possible.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q69. 74

DO NOT WRITE IN THIS COLUMN

70 I would go to see the doctor for a check up even if I lived far away

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q70 75

71. My future is brighter than I expected it to be

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q71 76

72 I have little to look forward to

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q72 77

73 Most people have a happier future than I do

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q73 78

74. I have lots of things I want to accomplish in the future

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q74 79

75 People who are always cheerful annoy me.

1	2	3	4	5	6	7
strongly disagree			neither agree nor disagree			strongly agree

Q75 80

Please continue

			DO NOT WRITE IN THIS COLUMN	
97	I am always courteous, even to people who are disagreeable	T F	Q97	27
98.	At times I have really insisted on having things my own way.	T F	Q98	28
99.	There have been occasions when I felt like smashing things.	T F	Q99	29
100	I would never think of letting someone else be punished for my wrongdoings.	T F	Q100	30
101.	I never resent being asked to return a favor	T F	Q101	31
102.	I have never been irked when people expressed ideas very different from my own.	T F	Q102	32
103	I never make a long trip without checking the safety of my car.	T F	Q103	33
104	There have been times when I was quite jealous of the good fortune of others.	T F	Q104	34
105	I have almost never felt the urge to tell someone off.	T F	Q105	35
106	I am sometimes irritated by people who ask favors of me.	T F	Q106	36
107	I have never felt that I was punished without cause.	T F	Q107	37
108	I sometimes think when people have misfortune they only got what they deserved.	T F	Q108	38

DO NOT WRITE IN THIS COLUMN

109 I have never deliberately said something that hurt someone's feelings T F — Q109 39

Now, please answer the following questions about yourself by circling the correct answer or writing a short answer in the space provided below the question

110 How old are you? — Q110 40 41

____ years

111 Please indicate the last year of education you completed — Q111 42 43

a. grade 8 or less
b. grade 9
c. some high school
d. grade 12
e. some vocational training
f. vocational certificate
g. some college
h. some university
i. college degree
j. university degree
k. graduate degree
l. other (please specify ____________________)

112 What is your marital status? — Q112 44

a. single
b. married
c. common-law
d. widowed
e. divorced

113 Do you have any children? — Q113 45

a. yes (go to question 114)
b. no (go to question 116)

114 Do your children live with you? — Q114 46

a. yes (go to question 115)
b. no (go to question 116)

Please continue

115. How old are your children?

_____ years

_____ years

_____ years

_____ years

_____ years

116. What is your occupation? If married or living common law, please also describe partner's occupation.

DO NOT WRITE IN THIS COLUMN

Q115 47 48

49 50 51

52 53 54

55 56

Q128 57 58

59 60 61

62 63 64

65 66 66

67 68 69

70

I.D. 1 2 3 4

RECORD 5

6 7 8 9 10

11 12 13 14 15

16 17 18 19 21

117. What religious group do you belong to?
- a. Jewish
- b. protestant
- c. catholic
- d. other (please specify ______________________)
- e. none

118. How often do you examine your breasts?
- a. once a month or more often
- b. once every two months
- c. once every three months
- d. once every four months
- e. once every five months
- f. once every six months
- g. once every seven months
- h. once every eight months
- i. once every nine months
- j. once every ten months
- k. once every eleven months
- l. once every twelve months
- m. not at all

Thank you for helping with this study

DO NOT WRITE IN THIS COLUMN

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Appendix VIII: Information sheet and consent (no payment) for validation study

Information sheet for the study

A Study of the Practice of Breast Self Examination

Conducted by: Karin Olson
26 Sundance Co-op
87 St. and 100 Ave.
Edmonton, Alberta T5H 4B4
Phone: 424-8516

The purpose of this information sheet is to briefly explain a study currently being done on breast self examination (BSE). Please feel free to keep it if you wish. This study is being conducted in conjunction with my doctoral studies.

The aim of the study is to understand from a woman's point of view why some women do and others do not do BSE. The information gained from this study will be used to develop special programs for women on BSE.

Permission to conduct this study has been received from the Department of Educational Psychology, the Faculty of Nursing at the University of Alberta, the management of the Woolco Store at Heritage Mall and the Zellers Department Stores at Kingsway and West Edmonton Malls, Dr. Otto Roob, the physicians at the Breast Centre, and the Alberta Cancer Board.

The study is in its second stage. In the first stage women were interviewed regarding their feelings about doing BSE, and from this information a questionnaire was developed and refined. The questionnaire is now ready for further study with a larger group of women.

If you are willing to participate in this study, please complete the questionnaire, which takes about 20 minutes, and both copies of the consent, and return one copy of the consent and the questionnaire in the enclosed envelope.

In any reports of this study, your name will never be associated with your comments. The only people who will see your answers are members of the study team at the University of Alberta and myself. A list connecting the identification number in the upper right hand section of the first page of your questionnaire with your name will be stored separately from the questionnaires in a locked filing cabinet. If, at some point in the future, you decide that you would like to have your comments removed from the study, please contact me at the address or phone number above and I will take your responses out of the study with no questions asked.

If you have any questions or would like to have something clarified, please do not hesitate to contact me at the above address or phone number.

Thank you for helping in this important study.

Consent for the study:
The identification of factors that inhibit and promote breast self examination

Being conducted by:
Karin Olson
26 Sundance Co-op
87 St. and 100 Ave.
Edmonton, Alberta
T5H 4B4
Phone: 424-8516

The purpose of this study is to identify the factors that inhibit and promote breast self examination from women's point of view.

The study has been explained to me and I have had an opportunity to have my questions about it answered.

I understand that there are no health risks or personal benefits associated with this study.

I understand that I may drop out at any time by phoning Karin Olson at 424-8516 or by writing to her at the above address and that no one will hold that against me.

I understand that I will not be described as an individual in any articles or talks about this study. My records in this study will only be marked with my identification number, not my name.

I give my permission for my comments to be used by Karin Olson in her lectures to students.

I give my permission for my comments to be used by Karin Olson in other studies she may do. I understand that in this case I will not be described as an individual in any articles or talks about this study and that my records will only be marked by my identification number as described above. I also understand that permission to do these later studies will be obtained from the appropriate ethics review committee(s).

I understand that I may cross out any part of this consent that I wish.

I have read this information and give my consent to participate in the study:

The identification of factors that inhibit and promote breast self examination

Name ______________________________

Address ______________________________

____

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Date ______________________________

Appendix IX: Revised consent (payment)

Consent for the study:
The identification of factors that inhibit and promote breast self examination

Being conducted by:
Karin Olson
11308 62 St.
Edmonton, Alberta T5W 4C1
Phone: 477-3890

The purpose of this study is to find out why women think some women do breast self examination(BSE) while others do not.

The study has been explained to me and I have had an opportunity to have my questions about it answered.

I understand that there are no health risks or personal benefits associated with this study.

I understand that I will not be described as an individual in any articles or talks about this study. My records in this study will only be marked with my identification number, not my name.

I give my permission for my comments to be used by Karin Olson in her lectures to students.

I give my permission for my comments to be used by Karin Olson in other studies she may do. I understand that in this case I will not be described as an individual in any articles or talks about this study and that my records will only be marked by my identification number as described above. I also understand that permission to do these later studies will be obtained from the appropriate ethics review committee(s).

I understand that I will be sent a cheque for $5.00 by mail once Karin Olson receives my completed questionnaire.

I understand that I may cross out any part of this consent that I wish.

I have read this information and give my consent to participate in the study:
The identification of factors that inhibit and promote breast self examination.

Name ____________________________

Address ____________________________

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Date ________________

Appendix X: Table of factor loadings

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 - - - - - - - - - - - - - - - - - - - - - -  F A C T O R   A N A L Y S I S  - - - - - - - - - - - - - - - - - - - - - -

VARIABLE     COMMUNALITY  *  FACTOR   EIGENVALUE   PCT OF VAR   CUM PCT

GO1              .70100   *     58       .17580          .2       97.9
GO2              .79700   *     59       .17062          .2       98.1
GO3              .73700   *     60       .16097          .2       98.4
GO4              .71400   *     61       .14113          .2       98.6
GO5              .73600   *     62       .13141          .2       98.7
GO6              .57200   *     63       .12588          .2       98.9
GO7              .65400   *     64       .11841          .2       99.1
GO8              .70200   *     65       .10708          .1       99.2
HOPE1            .60700   *     66       .10205          .1       99.4
HOPE2            .78900   *     67       .09415          .1       99.5
HOPE3            .77300   *     68       .08682          .1       99.6
HOPE4            .67700   *     69       .06919          .1       99.7
HOPE5            .67800   *     70       .06018          .1       99.8
HOPE6            .67600   *     71       .05970          .1       99.9
AGE              .65200   *     72       .05025          .1       99.9
EDUC             .61900   *     73       .04787          .1      100.0

  PAF EXTRACTED  20 FACTORS.   15 ITERATIONS REQUIRED.


FACTOR MATRIX:

               FACTOR  1    FACTOR  2    FACTOR  3    FACTOR  4    FACTOR  5    FACTOR  6    FACTOR  7    FACTOR  8

SCARED1          .36510       .27329       .28913      -.29772      -.10838      -.24009       .10523      -.00729
SCARED2          .23787       .16847       .17654      -.43830      -.04155      -.13522      -.06776      -.07306
SCARED3          .38075       .24889       .15630      -.39081      -.29079      -.27891      -.01546      -.00939
SCARED4          .37862       .28005       .19990      -.41886      -.28057      -.28283       .07968      -.13107
SCARED6          .15549       .12620      -.13700      -.22257      -.08405      -.01728       .04748       .06431
SCARED7          .07254       .08549       .14685      -.10479      -.10630      -.20040       .22020      -.14401
FATAL1           .26107       .08267       .10428      -.18798      -.11064      -.04620       .04987      -.07356
FATAL3           .29060       .11391       .15007      -.10935      -.03008      -.19472      -.01717       .23928
FATAL4           .43184      -.04588      -.17483       .10759      -.07387      -.15255       .28654      -.08502
FATAL5           .45403       .02209       .18110      -.05707       .02986      -.13760       .09254       .10938
FATAL6           .44823       .08376       .28397      -.05211      -.25655      -.15745       .05132       .07925
FATAL7           .41149       .07866       .31166       .05697       .02833      -.00825       .19754       .03624
FATAL8           .66289       .02820      -.27924       .09168      -.10023      -.06163       .21197       .12680
OTHER1           .56544      -.47653       .29695       .04451      -.10587       .13320      -.21778       .02851
OTHER2           .41401      -.44507       .29571      -.18748      -.10938       .34374      -.17648      -.13161
OTHER3           .58041      -.40421       .19775      -.06320      -.25073       .26859       .08558       .03234
OTHER4           .60408      -.24032       .06846       .08971      -.10009      -.05098      -.15296      -.09043
OTHER5           .56867      -.00673      -.40956       .21271      -.18903       .03557       .21701       .07593
OTHER6           .55880      -.19604      -.34343       .04403      -.31624       .04907      -.01568      -.01085
OTHER7           .59207      -.50197       .22003      -.03836      -.16093       .17989       .03624      -.08029
OTHER8           .46544      -.12529       .09996      -.00036      -.09154       .14791      -.11196      -.00639
UGLY1            .47481       .28689       .16415       .02774      -.04389       .29762       .22031      -.03506
UGLY2            .21168       .15542       .26357      -.17732      -.19753       .34432       .10238      -.16998
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- - - - - - - - - - - - - - - - - - - - -  F A C T O R   A N A L Y S I S  - - - - - - - - - - - - - - - - - - - - -

              FACTOR  1    FACTOR  2    FACTOR  3    FACTOR  4    FACTOR  5    FACTOR  6    FACTOR  7    FACTOR  8

UGLY3           .38990       .14396       .25704      -.06024       .08966       .39654       .17934      -.07991
UGLY4           .20804       .34319       .22046       .06320       .01480       .15809       .37953       .00604
UGLY6           .27870       .35553       .12026      -.13356       .11893       .13034      -.11143      -.06140
WONT2           .44041      -.11766      -.18220       .06506      -.16631       .11727       .01478       .06093
WONT3           .74296      -.27654       .15992      -.00366      -.18147       .10295       .09176       .02980
WONT4           .70347      -.21498       .16975       .04144      -.19573       .06881       .09126       .06616
WONT5           .49828      -.27085      -.08071       .20457      -.08551      -.14496      -.03065      -.10259
WONT6           .28336      -.04098      -.15960       .12998       .03322      -.12513      -.12566      -.16624
ROLL1          -.02601      -.02293      -.01403       .29800      -.01022       .17826       .14124       .30772
ROLL2          -.07849      -.08115       .01408       .24719       .16655       .08536       .06359       .22923
ROLL3           .33589      -.17565      -.23779       .17503      -.11948       .14939      -.04906       .22103
ROLL4           .07776       .01123      -.11149       .28212      -.19238       .05494      -.05780       .20161
ROLL6           .34890      -.13903       .12532       .17542      -.07765       .03977       .07391       .00007
LEARN1          .66611       .07364      -.29705       .10657      -.14368      -.07982      -.14146       .00471
LEARN2          .68287       .16144      -.29537       .09248      -.05629      -.10436      -.05010       .04141
LEARN3          .66537       .08279      -.31946       .14751      -.17634      -.06705      -.17154      -.01958
LEARN4          .64151       .14422      -.42806       .02168      -.12978      -.07838      -.02345      -.00022
LEARN5          .22879      -.00601      -.27882      -.34088       .24539       .26094      -.14493       .27163
LEARN6          .20394       .02327      -.33382      -.20836       .23890       .29669      -.19601       .26676
LEARN7          .67136       .08192      -.44992      -.04668       .08449      -.04017       .18615      -.04581
LEARN8          .39657       .19861      -.29743      -.08261       .04570      -.05026      -.18708      -.00972
EMBAR1          .38822       .25853       .11731      -.21923       .09792      -.09451      -.27309       .37043
EMBAR2          .51888       .43105       .09271      -.18485       .00699       .00375      -.02329       .06446
EMBAR3          .48812       .25708       .04695      -.29112       .06965      -.01314      -.26535       .17455
EMBAR4          .45323       .17082       .10356      -.06567      -.08679       .05089       .08265       .15252
EMBAR5          .27901       .09840       .09929      -.09585       .04531       .03722       .15105       .17049
EMBAR6          .45793       .25630       .07208      -.17822       .11340       .06764      -.23807       .37745
TOLD1           .41146      -.36339       .04088      -.26417       .48881      -.15780       .14221      -.12368
TOLD2           .31050      -.01966      -.27724      -.15475       .31611      -.02864       .33913      -.22081
TOLD3           .46178      -.41784      -.00992      -.26024       .45203      -.15040       .08083      -.05358
TOLD4           .47129      -.11620      -.23516      -.17113       .16787      -.07400       .09085       .28435
TOLD5           .69475       .22606      -.11502      -.05401       .19564      -.08170       .17696      -.06469
TOLD6          -.30072      -.16767      -.11784      -.34445       .41868       .17360      -.01872       .07420
TOLD7           .39458      -.26233       .07019      -.25098       .46513       .13852       .06698       .05637
GO1             .37938      -.03070       .23436       .32998       .22107      -.25872       .00995       .15198
GO2             .55459      -.20095       .21586       .35611       .19852      -.26697       .01197      -.07744
GO3             .47520      -.09166       .23152       .33366       .18287      -.30595      -.02550       .05231
GO4             .21490      -.02324       .29818       .46242       .15925      -.21843      -.05739       .25902
GO5             .30656      -.09596       .42395       .24452       .22827      -.20556      -.18041       .01544
GO6             .27472       .02072      -.15491       .13680       .06772      -.05976      -.12984      -.09099
GO7             .41535       .04270      -.30250       .12870       .22529       .00153       .22828      -.08135
GO8             .52879      -.07611       .16369       .12189       .18323       .03857      -.03053       .08680
HOPE1           .30725       .27306       .17435       .22318       .04458       .27359       .14915      -.17481
HOPE2           .27575       .40344       .15214       .38667       .16270       .21824      -.23481      -.27028
HOPE3           .28939       .47025       .07317       .18346       .25046       .21202      -.19313      -.36663
HOPE4           .20558       .43816      -.02863       .31767       .00328       .08479       .01009       .05758
HOPE5           .41715       .26046       .09556       .19177       .09676       .08543      -.28481      -.24732
HOPE6           .35165       .23915      -.04707       .30057       .08345       .06132      -.26701      -.22230
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              FACTOR  1   FACTOR  2   FACTOR  3   FACTOR  4   FACTOR  5   FACTOR  6   FACTOR  7   FACTOR  8

AGE            -.26046      .18465      .13974      .20784      .23748     -.00407      .36949      .21027
EDUC            .00441     -.26060     -.08523     -.15460     -.01917     -.13879     -.36567     -.25538

              FACTOR  9   FACTOR 10   FACTOR 11   FACTOR 12   FACTOR 13   FACTOR 14   FACTOR 15   FACTOR 16

SCARED1        -.11427      .05591      .24624      .15204      .09490     -.11643      .08881      .03193
SCARED2        -.03287     -.02229      .07061      .03926      .18383     -.00294      .09123      .07295
SCARED3        -.03749      .03425      .05122      .12216      .09464     -.15644     -.04913      .05496
SCARED4        -.06229      .01206      .14441      .03647      .11884     -.11476      .09280      .03269
SCARED6         .07364      .37354      .18565      .28072      .09177      .17589      .13604      .04980
SCARED7         .19868      .18524      .05855      .01997     -.15628      .21129      .00782      .09666
FATAL1          .32608      .22817     -.02973     -.03418      .04798      .04519     -.07510     -.05961
FATAL3          .23525      .00604     -.07472     -.05229      .13779     -.10320     -.12126     -.12555
FATAL4         -.08106      .04258     -.28602     -.07095     -.15471      .09431      .06591      .06041
FATAL5         -.06600      .00980     -.24069     -.20159      .23203     -.12277      .22081     -.08909
FATAL6          .13947      .14492     -.32124     -.08621      .03599      .02881     -.02752     -.07393
FATAL7          .00452      .01264     -.11813     -.33559      .15699     -.09997     -.02031      .18658
FATAL8          .00342      .19073     -.24609     -.01402      .05647     -.07239      .04407      .02752
OTHER1         -.04746      .01525      .02355     -.01710      .02536      .05205      .06860      .03070
OTHER2          .00031     -.07001      .18433     -.11208     -.01094     -.01651     -.01334      .03276
OTHER3         -.06966     -.02187      .14419     -.06529     -.07425      .00295      .11649     -.12343
OTHER4          .01747     -.04584     -.10827      .02212     -.03681      .23437      .00739      .00887
OTHER5         -.16419      .14485     -.17826     -.09627     -.07867     -.18741      .05565      .01619
OTHER6         -.06453      .04931     -.07859      .04675     -.12452     -.08680      .01141      .03694
OTHER7          .00565      .00027      .09174     -.10185     -.09277     -.00763      .01086     -.10664
OTHER8          .08447     -.01579     -.15101      .19496      .09628      .07769     -.01104     -.19526
UGLY1           .15804     -.05859     -.01112     -.07879     -.06673      .02202     -.10975      .26748
UGLY2           .22408     -.08097     -.07891      .04519     -.00849     -.02189     -.13880      .24396
UGLY3           .15466     -.08536      .09084      .22851      .28274      .05715     -.04304      .10280
UGLY4           .02579      .00925      .02801     -.26031     -.12303      .28442      .16784     -.12330
UGLY6           .00643      .13190     -.00922     -.18723      .03983      .31320      .23791     -.17009
WONT2          -.14427     -.02648     -.08858      .05945      .08219      .00705     -.12305      .06749
WONT3          -.20325      .04489      .05154      .13483     -.21323     -.05672     -.05401     -.07805
WONT4          -.10461     -.04051      .06654      .10240     -.19558     -.07726     -.03140     -.11546
WONT5           .21353     -.21923     -.26944      .16981     -.00757     -.01244     -.02476     -.00949
WONT6           .10048     -.03752     -.07554      .27336      .07659      .11273     -.08009     -.09995
ROLL1           .02517     -.03487      .01093      .38437      .26558      .04326     -.12151      .02471
ROLL2          -.21017      .09631      .18190     -.01976      .01447      .05537     -.07229      .13325
ROLL3          -.23593      .15778      .17046     -.10679      .21467     -.05452      .21903      .05915
ROLL4           .09863     -.10436     -.02329      .12554      .28532      .17264      .24637     -.05146
ROLL6          -.05809     -.03892      .04661      .20835      .05855      .17354      .24423      .14181
LEARN1          .28380     -.28328      .18176     -.09716     -.02738      .00158      .02883      .08511
LEARN2          .27276     -.21812      .26461     -.15802     -.06292     -.05658      .05096     -.05545
LEARN3          .27327     -.25748      .20475     -.09820      .01614      .11659      .00260      .01999
LEARN4          .15006     -.04411      .16219     -.17334      .09698      .07304      .01298      .07461
LEARN5          .24846      .24345      .13010     -.00208     -.02500     -.13593     -.05746     -.07987
LEARN6          .27211      .45844     -.03792     -.05694     -.12036      .00969      .06097     -.04536
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               FACTOR  9    FACTOR 10    FACTOR 11    FACTOR 12    FACTOR 13    FACTOR 14    FACTOR 15    FACTOR 16

LEARN7           -.06120       .10493       .01756      -.02760       .08459      -.05541      -.00916      -.02970
LEARN8            .02817      -.05896       .00435       .05577      -.13253      -.14194       .00555       .00763
EMBAR1           -.17627      -.27572      -.06669       .00207      -.27185       .20093      -.03742       .22387
EMBAR2           -.17259      -.06361      -.11040       .00086      -.08308       .09781      -.15136      -.19904
EMBAR3           -.25138      -.12378      -.05038      -.01512      -.06155       .08874      -.05522      -.21753
EMBAR4            .05472      -.20428      -.17716       .06797       .05340      -.11891      -.13708      -.17354
EMBAR5           -.14927       .02606      -.07473       .08148       .06437      -.15164       .08616      -.02743
EMBAR6           -.23023      -.02615      -.02086       .10451      -.17913       .12817      -.04792       .24543
TOLD1            -.00343      -.19322       .02663      -.01433      -.01312      -.14800       .12153       .05365
TOLD2             .01615      -.07083       .04482       .14753      -.00303       .05873      -.08297      -.05797
TOLD3            -.00659      -.17968      -.01936      -.08737       .03012      -.15384       .10218       .04675
TOLD4            -.11115       .06965       .06859       .19126      -.15053       .12034       .01169      -.10737
TOLD5            -.10033       .12225       .10484       .04142      -.00874       .10160      -.12719      -.05609
TOLD6             .18221      -.07738      -.20225       .02890       .12036      -.02212       .02019       .11547
TOLD7             .10435      -.05355      -.23317       .05370       .02889       .03380       .06085       .04858
GO1               .01756       .04170      -.05139       .10916      -.01379       .19369      -.07364      -.06669
GO2              -.03676       .22444       .01091      -.10222      -.00482       .07444      -.06035       .10767
GO3               .13667       .28965       .03113       .07199      -.15055      -.02499       .07537       .21472
GO4               .17731       .06353       .04562       .01225       .05524      -.12731      -.10163      -.07972
GO5               .18120       .11210       .27839       .12101      -.08007      -.11444       .02160      -.08255
GO6              -.28166      -.03692       .02638      -.14262      -.36503       .05423      -.13902       .03532
GO7              -.26450      -.05849       .21167       .04670       .08395       .08019      -.13913      -.04300
GO8              -.11566       .04613       .20543      -.22156       .19309       .01483      -.22638      -.06556
HOPE1             .00321       .17089      -.04552      -.10960       .02509      -.02889      -.24425      -.02867
HOPE2             .03080       .03086       .05182       .02683      -.12713      -.21780       .01651      -.14440
HOPE3            -.09323       .04317      -.05943       .05534       .03752      -.10762       .18706       .00847
HOPE4            -.03256      -.02956       .02975       .04246      -.14372      -.22513       .03683       .15389
HOPE5            -.19218       .04747      -.08186       .06987       .05627      -.09041       .06202       .03031
HOPE6             .02654      -.08378      -.19037       .06731       .02571       .03933       .16978       .05767
AGE               .07832      -.34690       .08669      -.10968      -.01518       .12856       .12587      -.11764
EDUC             -.06078       .17164      -.08147      -.20176       .15129       .23805      -.24831       .10384

               FACTOR 17    FACTOR 18    FACTOR 19    FACTOR 20

SCARED1           .04674      -.01950       .05945       .14792
SCARED2          -.17585       .08236      -.02109       .02266
SCARED3          -.01868       .11046      -.01099      -.03149
SCARED4          -.08592       .06085       .03570      -.07268
SCARED6           .31038      -.04079      -.12998      -.03196
SCARED7           .23828       .08959      -.05889      -.11872
FATAL1            .14390       .03276       .19539      -.01647
FATAL3            .18319       .10247      -.10407       .20666
FATAL4            .02360       .04949       .09523       .01761
FATAL5           -.13934       .13591      -.0484[illegible]       .06203
FATAL6            .08723       .11026      -.04737      -.09821
FATAL7            .00273       .01798       .00176       .08872
FATAL8           -.05701      -.08463      -.07112      -.06638
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              FACTOR 17     FACTOR 18     FACTOR 19     FACTOR 20

OTHER1         -.03851        .10364       -.04188       -.06857
OTHER2          .00642        .12137        .02957        .15290
OTHER3          .01804       -.02436       -.09697       -.01631
OTHER4          .03356       -.01554       -.11962        .02153
OTHER5          .03503       -.05772       -.05894       -.02328
OTHER6          .03463       -.07414       -.02118        .08434
OTHER7          .04326        .12543       -.02830        .06195
OTHER8          .18553       -.01693        .04168       -.06640
UGLY1          -.00299       -.17033        .06161        .13620
UGLY2          -.08090       -.37827       -.11601        .00632
UGLY3          -.10003        .01986        .02453       -.09515
UGLY4           .05967       -.01047        .04655        .04592
UGLY6           .00492       -.14014       -.00473        .05286
WONT2           .03379        .05743        .07642       -.10494
WONT3          -.02720        .00960        .01473       -.04319
WONT4          -.01836       -.04613        .07257       -.00503
WONT5           .04131        .07146        .07430       -.05130
WONT6          -.01096        .10771       -.06634        .02099
ROLL1           .02752        .01878        .09437       -.00006
ROLL2           .06625        .19504       -.01788        .13699
ROLL3           .12493       -.08022        .06589        .14086
ROLL4          -.08777       -.15372        .17414       -.07748
ROLL6          -.18548        .08521       -.06809        .06930
LEARN1         -.09767        .09137       -.06252       -.10856
LEARN2          .02457        .00630        .04259        .00248
LEARN3         -.02394        .05247       -.05341       -.04501
LEARN4          .05055        .02274       -.04307       -.00691
LEARN5          .01276        .02722        .17048       -.07616
LEARN6         -.11308        .02674       -.03748       -.02978
LEARN7         -.11168        .00510       -.00759        .00711
LEARN8         -.11240       -.13716       -.02836        .20983
EMBAR1          .05541        .06999        .03779       -.03904
EMBAR2          .01440       -.08571        .09659       -.05072
EMBAR3         -.09532       -.08524        .00108       -.03103
EMBAR4          .06331       -.13151        .01743        .14809
EMBAR5         -.01904        .06663        .11207       -.08259
EMBAR6          .08449        .00812        .03766       -.09271
TOLD1           .23446       -.12008       -.00347       -.10989
TOLD2          -.06858        .12551        .17745        .08459
TOLD3           .17259       -.21090        .04913       -.15711
TOLD4          -.13591       -.05855        .08323        .19335
TOLD5          -.17142        .02736       -.09300        .05253
TOLD6          -.09240        .13796       -.11397        .11183
TOLD7           .05310        .10661       -.10636        .06236
GO1            -.05783       -.09509       -.33918        .08369
GO2            -.12913       -.01357        .10428       -.11045
GO3            -.20091       -.06768        .17760       -.04467
GO4            -.05053       -.08527       -.01536        .09094
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- - - - - - - - - - - - - - - - - - - - - - - - -   F A C T O R   A N A L Y S I S   - - - - - - - - - - - - - - - - - - - - - - - - -

                  FACTOR 17      FACTOR 18      FACTOR 19      FACTOR 20

G05                 .12024        -.16687         .01904         .09960
G06                 .14543        -.17261        -.09639        -.00355
G07                 .15866         .05273        -.11350        -.03048
G08                -.07919        -.01332         .07231        -.20309
HOPE1               .00145         .11902         .02959        -.02087
HOPE2              -.00231         .10538        -.04856        -.10007
HOPE3               .01815         .02033        -.22381        -.15896
HOPE4               .22835         .18567        -.07646         .09075
HOPE5               .05969         .05537         .14909         .05341
HOPE6               .17375         .01005         .28245         .12771
AGE                 .00472         .10993         .12228         .01510
EDUC                .07453         .01604         .15658         .13448


FINAL STATISTICS:

VARIABLE       COMMUNALITY   *   FACTOR    EIGENVALUE    PCT OF VAR    CUM PCT
                             *
SCARED1           .62012     *      1       13.66922        18.7         18.7
SCARED2           .43240     *      2        3.83863         5.3         24.0
SCARED3           .61941     *      3        3.38676         4.6         28.6
SCARED4           .70025     *      4        3.25424         4.5         33.1
SCARED6           .55665     *      5        2.50205         3.4         36.5
SCARED7           .40426     *      6        2.03918         2.8         39.3
FATAL1            .37769     *      7        1.98373         2.7         42.0
FATAL3            .44967     *      8        1.77648         2.4         44.5
FATAL4            .49722     *      9        1.61131         2.2         46.7
FATAL5            .55576     *     10        1.53134         2.1         48.8
FATAL6            .58189     *     11        1.35870         1.9         50.6
FATAL7            .52192     *     12        1.25408         1.7         52.3
FATAL8            .72961     *     13        1.16612         1.6         53.9
OTHER1            .74517     *     14        1.08612         1.5         55.4
OTHER2            .76278     *     15         .91770         1.3         56.7
OTHER3            .76204     *     16         .87671         1.2         57.9
OTHER4            .56678     *     17         .85347         1.2         59.0
OTHER5            .76850     *     18         .76606         1.0         60.1
OTHER6            .62710     *     19         .74278         1.0         61.1
OTHER7            .77965     *     20         .62599          .9         62.0
OTHER8            .44776     *
UGLY1             .65037     *
UGLY2             .67433     *
UGLY3             .65363     *
UGLY4             .59959     *
UGLY6             .54397     *
WONT2             .37126     *
WONT3             .83166     *
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